

The MINING CONGRESS JOURNAL



The U. S. Treasury at Washington, D. C.

AUGUST
1935



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See the Program for this meeting on page 16 of this issue.

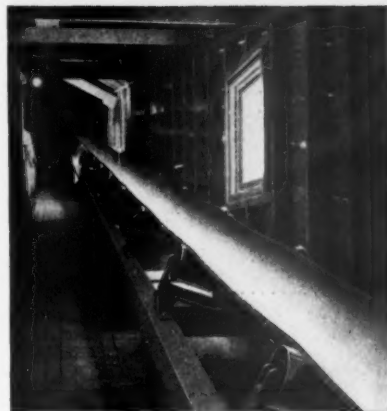
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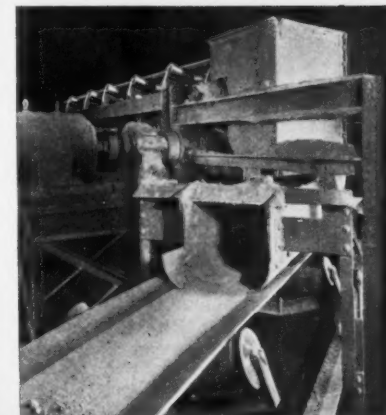
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NUMBER 8

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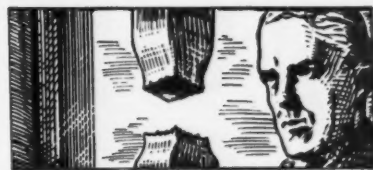
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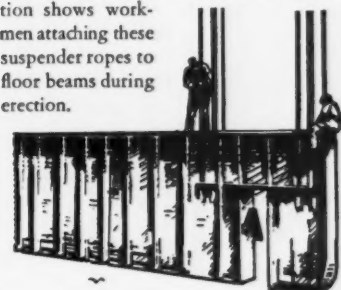
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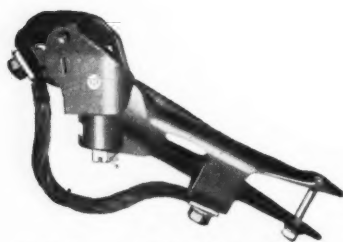
AUGUST, 1935

5



JUST as ocean voyagers have come to appreciate the dependability of modern liners, so too have mine operators discovered that the increased dependability of Ohio Brass locomotive equipment results in lower costs and greater profits. Ask the men who use O-B headlights, resistances, trolley wheels, and shoes why they are preferred. The answer is invariably the same: "Because they may be depended upon, day in and day out, to deliver maximum service at minimum cost."

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The MINING CONGRESS JOURNAL

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A Journal for the entire mining industry published by The American Mining Congress

Anti-Trust Laws



RECENTLY a committee of the American Bar Association recommended Federal action in regard to modification of the anti-trust laws, long the bugbear of American business. They propose a Federal Administrative Agency, to be set up with authority to pass in advance upon trade agreements made between two or more persons; with approval of the agreement, the parties thereto would automatically be relieved of the hampering restrictions of the anti-trust laws. They propose that such agency should first hold hearings, take testimony, and obtain facts upon which to base its findings as to whether the practices involved are within statutory provisions. Proper standards would be developed to define the scope and power of the agency. While its findings would be binding, its rulings would be subject to judicial review, and the agency would deal exclusively with industries entering interstate commerce. A major objective would be "to bring about, insofar as possible, co-operative activity between Federal and State governments in order that there shall be no twilight zone as to matters of jurisdiction and enforcement of this class of cases."

Much interest attaches to the recommendation of the Bar Association's committee. The anti-trust laws are once again in full force. With the passing of the National Industrial Recovery Act, industry is again face to face with its old enemy. For years leaders in industry have advocated a relaxing of these laws to permit the solving of competitive production problems. Some have asked outright repeal, but the majority have advocated a liberalization of the laws which would define the "twilight zone" and permit of cooperative agreements. With the hoped-for return to business activity it is increasingly important that something be done, and it is but natural that business should ask that such laws as the Sherman Law and the Clayton Act be clarified.

The Liberal Tradition



MR. LEWIS DOUGLAS, former Director of the Budget, has written a book. It is an interesting book aside from its obvious political implications. As Budget Director, Mr. Douglas had a close-up view of the New Deal's objectives. His origin is of the mining industry, and his views of special interest to mining men generally. He calls his new book "The Liberal Tradition" and it frankly and fearlessly discusses some of the Administration's pet projects in a manner that may not meet with universal approval.

Important in his conclusions is his view that the Administration is driving hard toward "collectivism," and

definitely away from what he terms "sound principles of State Controlled Economy." He lists seven major items to support his contention: (1) The Agricultural Adjustment Administration Act, which invests in the Executive complete power to plan agriculture and all processing of agricultural products; (2) The National Recovery Administration which vested in the Executive complete control of all industry and commerce; (3) The Wagner Labor Bill which centralizes control of all employer-employee relations; (4) The Guffey Coal Bill which in effect socializes coal mines; (5) The Securities Act which tends to make the United States Government the exclusive capitalist; (6) The Social Security Act which tends to socialize all savings; (7) The Banking Bill which vests in the Executive complete control over credit and socializes bank deposits.

On one point at least even his adversaries will agree with Mr. Douglas: there is no doubt that the aim of the Administration is that of centralized government. All those who are opposed to centralization of power in Washington will do well to listen to the warning sounded by "The Liberal Tradition."

The Metal Mining Convention



EIGHTY-SIX metal mining men of wide experience have been working diligently for the past few months to develop a Program for the Annual Metal Mining Convention of the American Mining Congress. While these men have had charge of the program they have had the cooperation of hundreds of mining men from every metal-producing district. Literally hundreds of suggestions have been received and it is evident that more than ordinary interest attends the development of this meeting.

The first preliminary program is presented in this issue. It represents the thoughtful judgment of the industry. The discussions to be presented offer an excellent opportunity to clarify the industry's views on matters of national importance.

It is the duty of every metal mining man who can possibly do so to attend the Chicago meeting, participate in the discussions, and lend aid and wisdom in outlining a platform for 1935-1936. "In union there is strength." The combined power of the metal industries is a strong factor in the future of the mining industry as a whole. Individual mining men are impotent in the face of the gigantic problems facing the industry. Each unit can greatly strengthen its position through cooperation, and through speaking with one voice upon problems of common interest and application. The Chicago Convention offers much that is worth while, and the mining man who has the best interest of his industry at heart will make every effort to meet with his fellow operators September 23-27, inclusive.

Wheels of



Government

WASHINGTON and the Congress are tired. So also is nearly everyone else. The executive departments of the government are having their troubles originating legislation and following it through the Houses of the Congress. There have been no vacations. Some of the Congressmen have had an airplane trip here and there; and some have been to Bermuda. One member of the upper House has for several weeks been lecturing at a California University. But representatives of industry must stay to the bitter end.

It is a matter of the point of view as to what constitutes the central feature of legislation in the past month and at the present time. To many the outstanding shock is the revenue bill. To begin with there was no bill, only a most unusual message from the President. Action was slow and it could not be learned when hearings before the Ways and Means Committee of the House of Representatives would be held or if hearings were to be held at all. Finally on July 5 it was announced that hearings would be held before the Committee on July 8 and that the hearings would be confined to expressions on the President's message embodying corporation income tax rates, inheritance taxes and income taxes in the high brackets. There was no preparation by the usual subcommittee of the Committee on Ways and Means and no recommendations were made by the Secretary of the Treasury. Owing to the late notice very few taxpayers and representatives of taxpayers were able to prepare in time to put their views before the committee, and the hearings were marked by a dearth of witnesses. On July 11 no witnesses appeared and the committee after sitting for some time went into executive session to consider other business.

In appearing before the Committee for the mining industry, Secretary Julian D. Conover, of the American Mining Congress said:

"We submit that the proposed graduated corporation income tax is an improper concept for the following reasons:

"1. It is inequitable.

"2. It constitutes an overburden to enterprise.

"3. It will retard recovery.

"4. It will tend to discourage development of mineral resources.

"(1) The inequitable features of a graduated corporation income tax are readily apparent upon a brief analysis. Such a tax deviates widely from the accepted principle of levying taxes in accordance with ability to pay. In the first place, it takes no account of the rate of return upon the invested capital. A large corporation, earning only 2 or 3 percent upon its investment, may be required to pay the maximum rate of tax (which the President suggested of 16½ percent), whereas many small corporations earning 15 percent, 20 percent or even more upon their investment, would by reason of their lower aggregate earnings pay only the minimum rate of tax. Secondly, a graduated corporation income tax takes no account of the size of the individual stockholder's investment. Millions of small investors in our large corporations would find their earnings taxed at the higher rates, whereas the large individual holdings of wealthy persons in many smaller, closely held corporate enterprises would be taxed at the lower rates.

"In the beginning of income taxation in this country, the 1913 law imposed a 1 percent tax on corporations and a 1 percent normal tax on individuals, from which dividends were exempt.

"In the succeeding years there has been no reduction but on the contrary a general increase in the corporation tax to the present rate of 13½ percent. The individual normal rates were increased particularly for the World War period, and have since been decreased to the present normal rate of 4 percent.

"It is hardly necessary to point out that corporations are simply groups of individuals who band their capital together for the purpose of developing a mining, industrial or other enterprise requiring an initial investment greater than the amount possessed by any one of the individuals taking part. Behind every dollar invested in such enterprises are the

saving and self-denial of some individual. The working dollar thus invested in the corporate form of business, representing the chief form of productive, wealth-producing activity in this country, is already penalized to the extent of 9½ percent upon its earnings as compared with the dollar invested in a bond or in an individual or partnership business. The graduated corporation tax would not only carry this further but would be distinctly unjust and discriminatory. Is it not sound public policy to encourage saving and investment in organized industry, rather than to submit those who associate themselves with others in the risks of productive enterprise to such discriminating taxation?

"(2) A graduated corporation income tax initiated at the present time would constitute an overburden on industries which are now and have been for several years sorely tried in attempting to survive. There has been too long a period with little or no profit for the mining and related industries; and as a result these industries have been handicapped in the purchase of modern equipment with which to effect the economies made necessary by the competition of the present. The preponderance of the capital available to them has gone into the increased wage cost per unit of production, and for taxes of all sorts, including high state and local levies, capital stock taxes, etc.

"The manufactured articles into which the products of our mines go are in competition in the markets of the world with foreign goods produced with low-wage labor. It is necessary, it is vital that our producing enterprises be enabled to secure modernized equipment and to establish the most efficient industrial practices in the world. Through such means we will be enabled to maintain present wage levels and at the same time to compete in world markets and to recover and extend our foreign trade. Industry overburdened by taxation cannot equip itself as American industry should and must be equipped. Only through the optimistic use of capital and the most modern equipment can the present wage levels be maintained in this country.

"(3) A graduated corporation income tax would retard the recovery toward

which all elements in this country have striven so persistently over the past six years. Workmen must be employed and only through the production of a maximum of goods and services can such employment be created. The Secretary of the Treasury, in appearing before this committee a few days ago, indicated his belief that the worst of our present emergency is now over, and that business is improving. The return of confidence on the part of investors, small and large, will make available the reservoir of savings needed for the conduct of enterprises on a scale which will permit of low unit-production costs. Such a restoration of confidence and increased volume of business will produce far more revenue than inequitable changes in the tax system which make for business unsettlement.

"(4) The imposition of a graduated corporation income tax would bear with special weight upon the mining industry because of the special risks which accompany the development of mineral resources. In prospecting and exploration for new ore-bodies, there are far more ventures which encounter failure and disappointment than there are successes. Only one prospect out of many ever finds sufficient ore to permit of any actual production, and of those which reach the producing stage only a small proportion ever make a real profit. The odds are extremely long against any individual enterprise undertaken by a small group or small corporation. Consequently it is generally essential that a mining company have sufficient capital to enable it to so diversify its risks that its few successful developments will carry the burden of the many attempts which fail; and through large corporations functioning in this manner, the savings of many thousands of investors can be made available with reasonable conservatism for the development of natural resources. To discriminate against such corporations on the mere basis of size, particularly where such size serves a desirable economic end, is to discourage investment in our second largest industry; an industry which is the primary source of half this nation's wealth, which employs in normal times 2,000,000 workers, and upon which 25,000,000 people are directly or indirectly dependent for their livelihood.

"The mineral industry of this country is by its very nature dependent upon continued discovery and development of new mines. For obvious reasons, including the ever-present possibility of a national emergency, we urge that nothing be done which would lessen the adventurous and aggressive attitude of mining investors and mining men in the finding of additional mineral deposits which will take the place of our present operating mines and of the old and high cost properties which have been abandoned in the course of the fierce competition of the past six years.

Closing the hearings the Committee on Ways and Means drafted H. R. 8974, the Revenue act of 1935, providing for a modified graduated income tax ranging from 13½ percent on incomes less than

*Excess Profits Tax		
Excess profits	Proposed tax	Present tax
8 to 12 percent.....	5 percent.....	No tax
12½ percent.....	.....	5 percent
12 to 16 percent.....	10 percent.....	5 percent
16 to 25 percent.....	15 percent.....	5 percent
Over 25 percent.....	20 percent.....	5 percent

*(Reputed yield—\$100,000,000).

\$15,000 to 14¼ percent on incomes exceeding that amount. An excess profits tax was embodied to succeed the present levy of 5 percent on profits in excess of 12½ percent.

Individual income, inheritance and gift tax schedules were introduced which levied to a harmful extent against capital which should be available for the expansion of industrial enterprise and the modernization of our present industrial equipment.

As soon as the revenue bill was introduced in the House, hearings were announced by the Senate Committee on Finance, to begin July 31. Again little time was afforded for taxpayers and their representatives to prepare appearances for the hearings. The American Mining Congress again appeared, making a brief statement to the Finance Committee on the following three points:

- (1) The graduated corporation income tax.
- (2) Denial of the right to revalue under the excess profits tax.
- (3) Elimination of taxes in connection with the liquidation of subsidiary corporations.

Excerpts from the testimony, including questions by the chairman, Senator Pat Harrison, of Mississippi, follow:

"(1) We are opposed to the principle of a graduated corporation income tax. We submit that such a tax, in which the rate is based merely on the size of the corporate income without reference to invested capital or the size of individual stockholders' interests, is unsound and unfair.

"We wish to register our belief that merely narrowing the range of the proposed graduation does not alter the principle involved, and that this principle should not be incorporated in our tax structure.

"(2) The bill before your committee calls for a complete revision of the present excess profits tax, including both a raising of the rates and a lowering of the exemption, but denies the right of the corporate taxpayer to make a revaluation of its capital stock. We submit that this is unjust.

"In the Revenue Act of 1934 the excess profits tax, originally enacted as a part of the National Industrial Recovery Act, was extended for an indefinite period and provision was specifically made whereby corporations could make a new declaration of value of their capital stock, upon which both the capital stock tax and excess profits tax would be computed.

"Under this Act, declarations of value by mining and smelting companies were of necessity made at a time of pronounced business unsettlement. In most cases companies engaged in the mining and dependent industries had an entirely inadequate basis for determining a suitable value."

The Chairman: You think that the change in the capital value now of many of these mining companies, due to the increased prices of certain of their products, would work an inequity?

Mr. Conover: We do unless they are given the right to make a new declaration of the value.

The Chairman: If you are going to apply an excess profits tax?

Mr. Conover: That is correct Senator.

When the previous valuations were made, prices of various mineral commodities were at or near the lowest levels in history; earnings had been extremely small or entirely lacking for some years, and the prospects of future earnings were very dubious. Future prices and costs of production, the two principal factors in determining possible profits, were extremely uncertain. Under the circumstances, values were necessarily declared not on the basis of assured earning power but largely as a matter of guess work.

The Chairman: They would raise no objection to an increased tax on the capital stock transfer if they could get the new valuation?

Mr. Conover: You mean on transfers of capital stock?

The Chairman: Yes.

Mr. Conover: I do not understand that the question of stock transfers is involved.

The Chairman: On every issue of capital stock there is a tax imposed?

Mr. Conover: Yes, sir.

The Chairman: It is very small. Then, in order to prevent these corporations from undervaluing their capital stock, they put the 5 percent or whatever it is, on the excess over 12½ percent. They are permitted to do that, and on any additional earnings over 12½ percent there is 5 percent I believe it is that is imposed.

Mr. Conover: You are referring to the present law.

The Chairman: Yes. We did that in order to give these people the right to voluntarily set up their own capital stock and say what the value of it was. Now if we should permit new declarations of

capital stock, you would not object to an increase in the capital stock issue?

Mr. Conover: No, the companies would be, if I understand you correctly, the corporations would be entirely willing to pay the present rate of capital stock tax on their new declared value.

In connection with these previous valuations, the amount of tax which would be required under the capital stock tax, on the one hand, and the excess profits tax on the other were of course given consideration, and in the absence of many of the usual yardsticks for establishing fair value, the anticipated taxes under these two heads were necessarily an important factor in arriving at the declared value. If the value thus declared should prove to be too high, the corporation would be penalized by an excessive capital stock tax. If the declared value should prove to be too low, the corporation would be penalized, at such time as earnings increased, by too great an excess profits tax. These contingencies were apparent and were of course taken into account in the declaration of capital stock value. On the basis of the capital stock and the excess profits tax rates then established, it was not anticipated that the rates of tax, and particularly the basic rate of earnings not subject to excess profits tax, would be arbitrarily changed without affording taxpayers the right of revaluation.

The bill now before your committee proposes a drastic change both in the base and the rates of the excess profits tax. Instead of a rate of 5 percent on earnings in excess of 12½ percent of the adjusted declared value, it would provide rates of 5 percent to 20 percent on earnings in excess of only 8 percent of the adjusted declared value. This would make a vast difference in the tax liability of great numbers of corporations, particularly where the value previously declared has proved to be too low; in other words, where improved markets or other changed conditions make the value today greater than was declared at that time.

We respectfully submit that if a change in the excess profits tax is now considered necessary, it should, as a matter of justice to taxpayers, be accompanied by the right to re-declare the value of the capital stock in the same manner as accorded in the 1934 Act.

As to the application of the proposed rates of tax, we wish to point out that the proposed base of 8 percent, with excess profits taxes on all earnings in excess of that percent, would bear with special severity upon the mining and smelting industry. These enterprises generally are subject to more violent fluctuations in earnings than many other types of industrial activities. The market price and volume of business varies widely from year to year. Usually a number of years of small earnings or losses are followed by short periods in which earnings are relatively large. In the latter periods an income of far more than 8 percent is needed to make up for the losses of the previous years. In-

vestment in mining properties would greatly diminish if profits substantially in excess of 8 percent could not be realized in good times. To impose excessive taxes not only would cut down the chance of recovering losses previously sustained, but would discourage investment in this industry.

If it is the feeling of Congress that a more drastic excess profits tax is needed, we suggest that careful consideration be given to industries such as the mining and smelting industry which are marked by violent fluctuations in income, and that the law be written so as to levy the taxes more nearly on average income over a period of years than solely on the income of fortunate years. Prior to 1933, taxpayers were permitted to carry forward losses as a deduction against the profits of the following years, and we respectfully suggest that in case your committee sees fit to adopt an excess profits tax schedule such as now proposed, a similar provision for the carrying forward of the previous years' losses be made, at least in so far as such excess profits tax is concerned.

(3) The third subject on which we wish to comment is the proposed addition to the bill now before you of a provision to eliminate all taxes in connection with the liquidation of subsidiary companies. We understand from the public press that your chairman has directed Mr. L. H. Parker, Chief of Staff of the Joint Committee on Internal Revenue Taxation, to draft such a provision for the consideration of the committee.

The Chairman: I would suggest to you on that, that we have instructed our experts to give special study to the proposition.

Mr. Conover: I am very glad to hear that, Senator.

The Chairman: If you will just put your views in the record on that proposition, it will be given consideration.

Mr. Conover: We have stated them here, and will be glad to include them in the record.

Under the present law the Treasury Department has taken the position that elimination of a wholly-owned subsidiary by a parent corporation does not constitute a non-taxable reorganization under Section 112 of the Revenue Act of 1934, but that it constitutes a distribution in liquidation under Section 115(c) of that Act, and that such distribution results in gain or loss depending upon whether the amount of such distribution is greater or less than the cost to the parent of its stock in the subsidiary. This question has not yet been settled by the courts and there is no early prospect that it will be. This results in a most unfortunate uncertainty as to transactions of this type.

In many cases, mining and other corporations find it desirable to simplify their corporate structures through elimination of those subsidiary companies which are found to be unnecessary. However, such action, which incidentally is in harmony with the administration's expressed desire for simplification of

corporate structures, is largely thwarted by the Treasury's view that elimination of such subsidiary corporations results in taxable gain or deductible loss to the parent corporation.

We submit that when a subsidiary is dissolved and its assets transferred to the parent corporation there should be no tax upon such transaction. A parent and its wholly-owned subsidiary represent nothing more than a single business enterprise, owned by a single group of stockholders, in form operating under two separate entities. Under Section 112, the merging of two separate businesses owned by two separate and distinct groups of stockholders is treated as a non-taxable reorganization, and we submit that there is even more reason for according similar treatment to the consolidation of the various corporate branches of a single business enterprise.

We therefore endorse the proposal which we understand has been made by your chairman, and respectfully urge the adoption of such a provision.

In summary, the American Mining Congress urges the views of the mining industries of this country as follows:

1. The graduated corporation income tax is wrong in principle and should not be adopted in any form.

2. In case a revision of the present excess profits tax is desired by Congress, this should be accompanied by the right to re-declare the value of capital stock in the same manner as in the 1934 Act. Industries such as the mining and smelting industry, which are subject to extreme fluctuations in earnings, should be permitted to carry forward previous years' losses as a deduction against current income, at least in so far as excess profits tax is concerned.

3. The ambiguity in the present law relating to tax upon the liquidation of subsidiary corporations should be removed by a definite provision that such transactions are not subject to tax.

From the remarks made by the chairman in the course of this presentation, it was evident that the committee followed the mining viewpoint closely and with comprehension, particularly in the matter of the excess profits tax and the right to revalue thereunder, as well as on the elimination of taxes in connection with the liquidation of subsidiary corporations.

Next in interest to the mining industries comes the Guffey-Snyder Coal bill, H. R. 8379, on which hearings were concluded June 28. This bill has had a checkered experience in the past month. Due to the shadow of unconstitutionality which overhangs it, the Committee on Ways and Means and the subcommittee assigned particularly to the bill have put it aside for the Revenue bill, the Federal Alcohol Control bill and others. After the miners and producers of coal, in compliance with the written request of the President extended their existing wage agreement to September 16, 1935, interest again lagged.

(Concluded on page 19)

Of all things...

THE SENATE turned thumbs down on "the more abundant life" for bees that the New Deal had advocated for human beings. . . . It seems that among other things the AAA Amendments Bill sought to control the honey bee . . . sort of slow them up . . . so that hereafter when some little schoolboy said "the busy little bee" he would be all wrong. . . .

■ ■ ■
But Virginia's peppery Carter Glass threw a monkey wrench into the machinery. . . . He objected seriously to Secretary Wallace or any of his aides interfering with his bees, the Senator being something of a bee culturist. . . . And when it came out that the AAA aimed at controlling the "love life" of the queen bees, Glass laughed them right out of the Senate. . . .

■ ■ ■
And at the same time while the AAA was trying to cramp the style of the bees, the Entomology Bureau of the Department of Agriculture comes out with plans which would make bigger, and better, and stronger bees. . . . Government entomologists have been experimenting and breeding bees and they've just about gotten to the point where they have a bee with a longer wingspread so that it can travel more miles per day and thus manufacture more honey in less time! . . .

■ ■ ■
And then people wonder why it's hard to understand what's going on in Washington! . . .

■ ■ ■
The AAA Amendments Bill holds all records of the present session for length of discussion. . . . Counting the time it has been on the Senate floor and referred back to Committee again (four times) the bill was on the Senate floor for about five months of debate before being passed. . . .

■ ■ ■
John G. Pollard, former Governor of Virginia and a "good Democrat," recently revised his "connotary," a self-written dictionary. . . . The two latest ones:

"The New Deal—Dictated but not red."
"Political Bedfellows—Those who like the same bunk."

■ ■ ■
Roll-calls—calling the members of Congress to the chamber to transact business—consume a lot of time. . . . So far this session the House has wasted 72 hours (equal to 16 full meetings) in getting members to the floor. . . .

■ ■ ■
Once elected, a State has no right to recall its duly qualified Senatorial representatives. . . . That, at least, is the opinion of Senator Walter George, chairman of the Senate Elections Committee and noted constitutional authority (who passed on the seating of Sen. Rush Holt). . . . The opinion came as a result of reported agitation in Arizona because the Arizona Senators voted to uphold the President on the bonus veto. . . .

The Government is paying \$1,603.50 a month rent for the famous and palatial McLean mansion in Washington as headquarters for Rexford Tugwell's Rural Resettlement Division. . . . It's one of the Capital's outstanding homes . . . replete with paintings, statuary, and object d'art. . . . The paintings are covered with cellophane and the statuary wrapped. . . . Some have complained that the rental is high. . . . But it's worth it when one stops to think of the esthetic value to the stenographers who can look up to a prize painting while sitting at their typewriters. . . . A divisional chief has his office in what was once the mistresses' bedroom . . . the walls are decorated with angels and things . . . and his secretary's desk is in the adjoining bathroom. . . .

■ ■ ■
The Senate handed New York a little gift of three-quarters of a million dollars the other day that even New York didn't expect. . . . It authorizes the payment to New York State of \$764,143 for "aid in suppressing the insurrection against the U. S. in 1861 to 1865" . . . which is legal verbiage for saying that the Government is paying a 70-year-old debt for New York's help during the Civil War. . . .

■ ■ ■
While Utah is commonly known as the "Mormon State," for the first time in its history, it is represented in both Houses of Congress by a solid Mormon delegation. . . . Senators William H. King and Elbert H. Thomas and Representatives J. W. Robinson and Abe Murdock all attend services at the beautiful Mormon temple in Washington, one of the Capital's architectural beauties. . . . Incidentally, all four are Democrats . . . also something of a record.

■ ■ ■
The House Library Committee now has six portraits of the late Speaker Rainey from which it must choose one to hang in the Speaker's Room in the House of Representatives. . . . Six painters have submitted portraits. . . . He, whose is chosen, gets \$2,500 for his work. . . .

■ ■ ■
There are now roughly 150,000 Government employees in Washington. . . . That's only a fraction of the total number of Federal employees. . . . But the 150,000 occupy 180 separate buildings. . . . The Government owns 102 of these; rents the other 78. . . . The annual rent bill is more than the entire national expenditure was in one of the "good old years" in the '80's. . . . And it takes about 600 guards to patrol the buildings. . . .

■ ■ ■
The "G-Men" quarters are now the most popular attraction for Washington tourists, eclipsing even the U. S. Capitol. . . . The new Department of Justice Building contains 23 acres of floor space and has 29 elevators and is one of the most beautiful of the new "monumental" public structures in Washington. . . . The G-Men occupy only a part of the building but in the eyes of the tourists and visitors it is "The G-Men's building." . . .



THE METAL MINING CONVENTION

METAL mining men are giving much time and thought to the development of their annual meeting, to be held under the auspices of the Western Division, The American Mining Congress, at Chicago, Ill., September 23 to 27, inclusive. A program of outstanding merit is being developed by a committee of 86 operators representing every metal mining district in the United States.

The Western Division, which represents a very large percentage of the total metal production, is under the direction of E. A. Hamilton, general manager, United States Smelting Refining and Mining Company, and a board of governors composed of the following representatives of the industry:

ALASKA—Roy Earling, United States Smelting Refining & Mining Company.

ARIZONA—F. W. MacLennan, general manager, Miami Copper Company; Chas. R. Kuzell, general superintendent, United Verde Copper Company; ex-officio: Wm. Koerner, general manager, Magma Copper Company, and governor, Arizona Chapter, A. M. C.

CALIFORNIA—F. C. van Deinse, vice president, Yuba Cons. Gold Fields; Wm. A. Simkins, Empire Star Mines, Ltd.; ex-officio: G. Chester Brown, secretary, California Metal & Mineral Producers Association.

COLORADO—Charles A. Chase, general manager, Shenandoah-Dives Mining Company; Geo. H. Rupp, manager, mining department, Colorado Fuel & Iron Company; ex-officio: Robt. S. Palmer, secretary, Colorado Chapter, A. M. C.



WM. B. DALY
Chairman, Program Committee

IDAHO—Henry Lawrence Day, assistant manager, Hercules Mining Company; J. F. McCarthy, president, Hecla Mining Company.

MONTANA—Wm. B. Daly, manager of mines, Anaconda Copper Mining Company.

NEVADA—H. A. Johnson, general superintendent, Tonopah Mining Company; J. C. Kinnear, general manager, Nevada Consolidated Copper Corporation; ex-officio: Henry M. Rives, secretary, Nevada Mine Operators' Association.

NEW MEXICO—R. B. Tempest, general manager, Nevada Consolidated Copper Corporation; Ira L. Wright, general manager, Black Hawk Consolidated Mines.

OREGON—Robt. M. Betts, president, Quicksilver Syndicate.

OKLAHOMA—Geo. W. Potter, general superintendent of mines, Eagle-Picher Mining & Smelting Company; J. A. Robinson, general manager, Commerce Mining & Royalty Company; ex-officio: M. D. Harbaugh, secretary, Tri-State Zinc & Lead Ore Producers Association.

SOUTH DAKOTA—Bruce C. Yates, general manager, Homestake Mining Company.

TEXAS—Brent N. Rickard, manager, El Paso Smelting Works, American Smelting & Refining Company; H. F. Treichler, general manager, Texas Gulf Sulphur Company.

UTAH—Jas. W. Wade, vice president, Tintic Standard Mining Company; J. O. Elton, manager, International Smelting Company; ex-officio: A. G. Mackenzie, secretary, Utah Chapter, A. M. C.

WASHINGTON—Lewis P. Larsen, president, Pend Oreille Lead & Zinc Company; Dean Milnor Roberts, professor, Mining & Metallurgy, University of Washington.

The program committee for the Chicago meeting is under the guidance of Wm. B. Daly, manager of mines, Anaconda Copper Mining Company, as national chairman. State chairmen in all of the metal states are assisting Mr. Daly. They represent the following states and districts:

ARIZONA—P. G. Beckett, general manager, Phelps Dodge Corporation.

CALIFORNIA—W. Val DeCamp, general manager, Cardinal Gold Mining Company.

COLORADO—Charles A. Chase, general manager, Shenandoah-Dives Mining Company.

IDAHO—Axel P. Ramstedt, Tamarack & Custer Mining Company.

ILLINOIS—G. H. Jones, president, Hillside Fluor Spar Mines.

MICHIGAN—(Copper) Harry Vivian, Calumet & Hecla Consolidated Copper Company; (Iron Ore) Oliver M. Schaus, general superintendent, Montreal Mining Company.



E. A. HAMILTON
Chairman, Board of Governors

MINNESOTA—Carl Zapffe, manager of iron ore properties, Northern Pacific Railway Company.

MONTANA—J. D. MacKenzie, manager, E. Helena Plant, American Smelting and Refining Company.

NEVADA—J. C. Kinnear, general manager, Nevada Consolidated Copper Corporation.

NEW MEXICO—E. H. Wells, president, New Mexico School of Mines.

SOUTH DAKOTA—Guy N. Bjorge, assistant general manager, Homestake Mining Company.

TEXAS—H. E. Treichler, general manager, Texas Gulf Sulphur Company.

TRI-STATE—John A. Robinson, general manager, Commerce Mining & Royalty Company.

UTAH—W. J. O'Connor, manager, Utah department, American Smelting and Refining Company.

WISCONSIN—W. N. Smith, general manager, Vinegar Hill Zinc Company.

Assisting each state chairman is a state committee fully representative of the mining interests in the state. The entire program committee is as follows:

Chairman:

Wm. B. Daly, manager of mines, Anaconda Copper Mining Company, Butte, Mont.

ARIZONA—Chairman: P. G. Beckett, general manager, Phelps Dodge Corporation; Ross D. Leisk, assistant general manager, United Verde Extension Min-

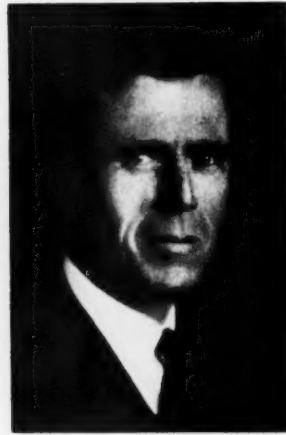
STATE CHAIRMEN—PROGRAM COMMITTEE



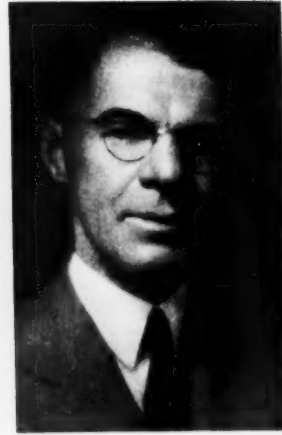
W. J. O'Connor



Carl Zapffe



H. E. Treichler



Chas. A. Chase



J. C. Kinnear



G. H. Jones



E. H. Wells



Guy N. Bjorge



A. P. Ramstedt



Val DeCamp

ing Company; T. H. O'Brien, general manager, Inspiration Consolidated Copper Company; Robt. E. Tally, Prescott, Ariz.; Robt. W. Thomas, general manager, Nevada Consolidated Copper Corporation; Wm. Koerner (governor, Arizona Chapter, American Mining Congress), general manager, Magma Copper Company.

CALIFORNIA—*Chairman*: W. Val De-Camp, general manager, Cardinal Gold Mining Company; F. C. van Deirse, Yuba Consolidated Gold Fields; Wm. A. Simkins, Empire Star Mines Company, Ltd.; John A. Burgess, Carson Hill Gold Mining Corporation; Julian Boyd, president, Mining Association of Southwest; G. Chester Brown, secretary, California Metal & Mineral Producers Association.

COLORADO—*Chairman*: Charles A. Chase, general manager, Shenandoah-Dives Mining Company; Geo. H. Rupp, manager, mining department, Colorado Fuel & Iron Company; Andrew A. Zangara, general manager, St. Joe Mining & Milling Company; John G. Clark, Boulder, Colo.; Jesse F. McDonald, manager, Downtown Mines Company; Robt. S. Palmer, secretary, Colorado Chapter, A. M. C.

IDAHO—*Chairman*: Axel P. Ramstedt, Tamarack & Custer Mining Company; Stanly A. Easton, president, Bunker Hill & Sullivan Mining & Con. Co.; H. G. Washburn, general manager, Federal Mining & Smelting Company; J. F. McCarthy, president, Hecla Mining Company; D. A. Callahan, president, Callahan Zinc-Lead Company.

manager, American Steel & Wire Company; Henry S. Beal, president, Sullivan Machinery Company; Alfred Kauffmann, vice president, Link-Belt Company; Clarence B. Randall, vice president, Inland Steel Company; David A. Gubbins, western sales manager, Anaconda Wire & Cable Company; H. J. Saladin, Standard Oil Company of Indiana; A. K. Bushman, General Electric Company.

MICHIGAN — (*Copper*) *Chairman*: Harry Vivian, Calumet & Hecla Consolidated Copper Company; (*Iron Ore*)—(*Michigan and Wisconsin*) *Chairman*: Oliver M. Schaus, general superintendent, Montreal Mining Company; R. S. Archibald, general manager, North Range Mining Company; S. R. Elliott, manager, mining department, The Cleveland-Cliffs Iron Company; Rudolph Ericson, general superintendent, Davidson Ore Mining Company.

MINNESOTA—*Chairman*: Carl Zapffe, manager of iron ore properties, Northern Pacific Railway Company; A. Y. Peterson, general superintendent of mines, Oliver Iron Mining Company; Max H. Barber, district superintendent, Mesaba District, The Cleveland-Cliffs Iron Company; Geo. P. Tweed, Coates & Tweed; Perry G. Harrison, general manager, Evergreen Mines Company; J. Wilbur Van Evera, manager, Gordon Mining Company; W. P. Chinn, general manager, Pickands Mather & Company; Frank W. Wilson, Alworth Interests; Clement K. Quinn, Duluth; W. M. Prindle, president, The Shawmut Company; J. A. MacKillican,



Robert S. Palmer

Henry M. Rives, secretary, Nevada Mine Operators' Association.

NEW MEXICO—*Chairman*: E. H. Wells, president, New Mexico School of Mines; Ira L. Wright, manager, Black Hawk Consolidated Mines Company; P. H. Argall, Peru Mining Company; H. M. Albright, vice president and general manager, U. S. Potash Company; J. T. Matson, American Metals Company.

SOUTH DAKOTA—*Chairman*: Guy N. Bjorge, assistant general manager, Homestake Mining Company.

TEXAS—*Chairman*: H. E. Treichler, general manager, Texas Gulf Sulphur Company; Brent N. Rickard, manager, El Paso Smelting Works, American Smelting & Refining Company.

TRI-STATE—*Chairman*: John A. Robinson, general manager, Commerce Mining & Royalty Company; Jas. A. Caselton, second vice president and secretary, St. Louis Smelting & Refining Company; Geo. W. Potter, vice president, Eagle-Picher Mining & Smelting Company; M. D. Harbaugh, secretary, Tri-State Zinc & Lead Ore Producers' Association.

UTAH—*Chairman*: W. J. O'Connor, manager, Utah Department, American Smelting & Refining Company; D. D. Moffat, vice president, Utah Copper Company; W. Mont Ferry, vice president and managing director, Silver-King Coalition Mines Company; Jas. W. Wade, vice president and general manager, Tintic Standard Mining Company; W. H. Eardley, assistant manager, U. S. Smelting, Refining & Mining Company; Duncan MacVichie, consulting engineer; J. O. Elton, manager, International Smelting & Refining Company; A. G. Mackenzie, secretary, Utah Chapter, American Mining Congress.

WISCONSIN—(*Lead and Zinc*) *Chairman*: W. N. Smith, general manager, Vinegar Hill Zinc Company.

COMMITTEE ON ARRANGEMENTS

G. H. Jones, President, Hillside Fluor Spar Mines.
Clarence B. Randall, Vice President, Inland Steel Co.
F. O. Case, Manager, International Smelting & Refining Co.
C. E. Biggert, President, Wisconsin Steel Co.
M. M. Leighton, Chief, State Geological Survey Division of Illinois.
H. J. Saladin, Standard Oil Co. of Indiana.
David A. Gubbins, Western Sales Manager, Anaconda Wire & Cable Co.
Alfred Kauffmann, Vice President, Link-Belt Co.
Henry S. Beal, President, Sullivan Machinery Co.
Charles A. Pratt, Vice President, Goodman Manufacturing Co.
Wilmer H. Cordes, Advertising Manager, American Steel & Wire Co.
A. K. Bushman, District Manager, General Electric Co.
L. E. Wemple, President, Illinois Zinc Co.
A. C. Callen, Head, Mining & Metallurgical Engineering Department, University of Illinois.
A. H. Cronk, Superintendent, Rosiclare Lead & Fluorspar Mining Co.

ILLINOIS—*Chairman*: G. H. Jones, president, Hillside Fluor Spar Mines; F. O. Case, manager, International Smelting & Refining Company; A. H. Cronk, superintendent, Rosiclare Lead & Fluorspar Mining Company; C. F. Biggert, president, Wisconsin Steel Company; A. Warsaw, president, Wedron Silica Company; A. C. Callen, head, mining and metallurgical engineering department, University of Illinois; M. M. Leighton, chief, State Geological Survey Division; L. E. Wemple, president, Illinois Zinc Company; Chas. A. Pratt, vice president, Goodman Manufacturing Company; Wilmer H. Cordes, advertising

manager, Meriden Iron Company; M. C. Lake, consulting geologist, M. A. Hanna Company.

MONTANA—*Chairman*: J. D. MacKenzie, manager, E. Helena Plant, American Smelting & Refining Company; F. A. Thomson, president, Montana School of Mines; Pearl I. Smith, Crystal Graphite Company; Russell B. Caples, general secretary, Anaconda Copper Mining Company; Carl J. Trauerman, president, Montana Mining Association.

NEVADA—*Chairman*: J. C. Kinnear, general manager, Nevada Consolidated Copper Corporation; L. D. Gordon, general manager, Penelas Mining Company;

PRELIMINARY PROGRAM

METAL MINING CONVENTION, WESTERN DIVISION THE AMERICAN MINING CONGRESS

Palmer House, Chicago, Illinois
September 23-27, 1935

Monday, September 23

9.00 A. M. REGISTRATION

10.30 A. M. CHAIRMAN (To be announced)

EXPANDING COPPER'S MARKET
(Speaker to be announced)

MODERN STEEL IN INDUSTRY
(Speaker to be announced)

NEW USES FOR LEAD
(Speaker to be announced)

INDUSTRIAL MARKETS FOR SILVER
(Speaker to be announced)

NEW MARKETS AND USES FOR ZINC
(Speaker to be announced)

12.00 Noon. LUNCHEON, Red Lacquer Room

JAMES F. CALLBREATH, *Secretary Emeritus, The American Mining Congress, Presiding*

Introducing:

HOWARD I. YOUNG, *President, The American Mining Congress.*

E. A. HAMILTON, *Chairman, Western Division.*

WM. B. DALY, *Chairman, Program Committee.*

JULIAN D. CONOVER, *Secretary, The American Mining Congress.*

2.30 P. M. CHAIRMAN: (To be announced)

PLANNING FOR PRODUCTION OF MINERAL PRODUCTS

DR. C. K. LEITH, *Vice Chairman, Planning Committee for Mineral Policy, National Resources Board.*

THE GOVERNMENT'S POLICY TOWARD WESTERN MINERAL STATES

THE HONORABLE JOHN WELLINGTON FINCH, *Director, United States Bureau of Mines.*

OUR PUBLIC LAND POLICY

Suggested Speaker—THE HONORABLE HAROLD I. ICKES, *Secretary of the Interior.*

PAPER being arranged by Arizona Section Program Committee (Topic and speaker to be announced)

Tuesday, September 24

10.00 A. M. CHAIRMAN: (To be announced)

WORKABLE STABILIZATION OF MINERAL PRODUCTION

ROBT. E. TALLY, *Prescott, Ariz.*

NON-FERROUS INDUSTRIES AND NATIONAL PROSPERITY

W. MONT FERRY, *Vice President and Mng. Director, Silver-King Coalition Mines Company.*

EFFECT OF SILVER PURCHASE POLICY ON WORLD CURRENCIES AND TRADE

THE HONORABLE KEY PITTMAN, *Senator from Nevada.*

ECONOMIC PLANNING AND NATIONAL PROSPERITY

(Speaker to be announced)

12.00 Noon. LUNCHEON MEETING—Western Division, The American Mining Congress

2.30 P. M. CHAIRMAN: (To be announced)
THE ECONOMY OF THE MACHINE AGE

A. G. MCGREGOR, *London, England.*

DEVELOPMENTS IN DETACHABLE BITS

1. Inland Steel Company—R. D. SATTERLEY, *Superintendent, Greenwood Mine.*

2. American Zinc Company of Tennessee—H. A. COY.

3. Climax Molybdenum Company.

DEVELOPING SAFETY IN METAL MINES

D. HARRINGTON, *United States Bureau of Mines.*

Discussion giving description of effective safety practices by a representative of each of the following groups:

Copper—(Speaker to be announced).

Lead—(Speaker to be announced).

Iron—(Speaker to be announced).

Zinc—(Speaker to be announced).

Gold—A representative of the Homestake Mining Company.

Silver—(Speaker to be announced).

Wednesday, September 25

10.00 A. M.—CHAIRMAN (To be announced)

EFFICIENT METHODS OF UNDERGROUND HAULAGE

(Speaker to be announced)

PREVENTION OF SILICOSIS THROUGH MODERN DUST CONTROL

D. E. CUMMINGS, *Field Director, Saranac Laboratory for the Study of Tuberculosis.*

METHOD OF UNDERGROUND DUST CONTROL

By a representative of the Phelps Dodge Corporation.

IMPROVED UNDERGROUND LIGHTING

(Speaker to be announced)

NEW DEVELOPMENTS IN GEOPHYSICAL PROSPECTING

(Speaker to be announced)

12.00 Noon. LUNCHEON MEETING—Sponsored by Tri-State Zinc & Lead Ore Producers Association

Topic: INDUSTRIAL RELATIONS IN THE TRI-STATE DISTRICT

By M. D. HARBAUGH, *Secretary, Tri-State Zinc & Lead Ore Producers Association.*

2.30 P. M. CHAIRMAN: (To be announced)

THE CHALLENGE TO INDUSTRY

(Speaker to be announced)

INDUSTRY'S RESPONSIBILITY TO ITS GOVERNMENT, ITS EMPLOYEES, ITS STOCKHOLDERS

(Speaker to be announced)

MAJOR FACTORS INVOLVED IN MINING'S REHABILITATION

(Speaker to be announced)

IRON ORE—ITS CONTRIBUTION TO INDUSTRIAL AMERICA

(Speaker to be announced)

MODERN INDUSTRIAL RELATIONS IN THE METAL MINING INDUSTRIES

(Speaker to be announced)

4.00 P. M. Annual Meeting, Board of Governors, Western Division, American Mining Congress

Thursday, September 26

10.00 A.M. CHAIRMAN: (To be announced)

THE REVENUE ACT OF 1935

A. W. DICKINSON, *The American Mining Congress.*

INTERNATIONAL TAX PROBLEMS

H. B. FERNALD, of *Loomis, Sufferin & Fernald.*

ADDED TAX BURDENS TO MEET SOCIAL LEGISLATIVE REQUIREMENTS

(Speaker to be announced)

TREASURY TREATMENT OF DEPRECIATION ALLOWANCES

E. C. ALVORD, *Attorney.*

GOVERNMENT SPENDING OF THE TAXPAYERS' MONEY

(Speaker to be announced)

IRON ORE TAXES

CARL ZAPFFE, *Manager, Iron Ore Properties, Northern Pacific Railway Company.*

PAPER on some phase of taxation, being arranged by Arizona section, Program Committee

(Topic and speaker to be announced)

12.00 Noon. LUNCHEON MEETING—Sponsored by Lake Superior Iron Ore Association
(Topic to be announced)

2.30 P.M. CHAIRMAN: (To be announced)

WAGNER LABOR DISPUTES LAW—SOCIAL LEGISLATION—THIRTY-HOUR BILLS

Suggested Speaker—HARPER SIBLEY, *President, U. S. Chamber of Commerce.*

Discussion by leaders in all branches of the mineral industry:

Coal—J. P. WILLIAMS, JR., *President, Koppers Coal & Transportation Company.*

Cement—(Speaker to be announced).

Copper—(Speaker to be announced).

Zinc—D. A. CALLAHAN, *President, Callahan Zinc-Lead Company.*

Manufacturing—GEO. P. TORRENCE, *President, Link-Belt Company.*

Gold—(Speaker to be announced).

Lead — } (Speaker to be announced).

Silver— }

Iron—J. B. PUTNAM, *Pickands Mather & Company.*

Steel—(Speaker to be announced)

LABOR UNION RESPONSIBILITIES

(Speaker to be announced)

Friday, September 27

10.00 A.M. CHAIRMAN: (To be announced)
FLOTATION OF FLOUR GOLD AND OXIDIZED GOLD

(Speaker to be announced)

RECENT TRENDS IN DESIGN AND CONSTRUCTION OF GOLD AND SILVER MILLS

EDWARD L. SWEENEY, *Consulting Engineer.*

HANDLING HEAVY MEDIA IN MINERAL SEPARATION

(Speaker to be announced)

ADVANTAGES FOR USING MODERN EXPLOSIVES

J. BARAB, *Hercules Powder Company.*

12.00 Noon. LUNCHEON MEETING

Topic: COOPERATIVE ACTION IN BEHALF OF MINING

(Presidents of all mining associations—coal and metal. Joint conference on Coordinated Action.)

ADJOURNMENT

2.00 P.M. TRIPS: To be arranged by local Trips Committee.

E. R. Shorey, associate professor of mining and metallurgy, University of Wisconsin.

Upon acceptance of the chairmanship of the committee, Mr. Daly immediately started the work of developing a program that would be fully representative of the entire industry. A questionnaire was sent to some four thousand mining men, seeking their recommendations as to topics of particular interest to the industry. These suggestions have been classified and coordinated, and submitted to the state chairmen for assistance in making their recommendations for topics. Meetings have been held in each of the districts, sponsored by the state chairman, and from the recommendations received from all sources a tentative program has been developed and submitted to the industry for consideration. This preliminary program covers a wide range of topics, and is shown herewith.

In conjunction with the convention will be held an exposition of mining machinery and supplies. Already this exposition promises to be an unusually interesting one, with the leading manufacturers of equipment participating. The following well-known companies will exhibit:

Allen-Sherman-Hoff Co.
Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
Atlas Lumnite Cement Co.
Atlas Powder Co.
E. I. du Pont de Nemours & Co.
Thomas A. Edison, Inc.
Fairbanks, Morse & Co.
General Electric Co.
Goodman Manufacturing Co.
Hercules Powder Co.
Jeffrey Mfg. Co.
Knox Mfg. Co.
Link-Belt Co.
Mancha Storage Battery Loco. Co.
Marion Steam Shovel Co.
McGraw-Hill Publishing Co.
Mine Safety Appliances Co.
Nat'l Malleable & Steel Casting Co.
Ohio Brass Co.
John A. Roebling's Sons Co.
St. Louis Power Shovel Co.
Sanford-Day Iron Works, Inc.
Sauerman Brothers.
Timken Roller Bearing Co.
U. S. Steel Corp.
West Virginia Rail Co.
Ziv Steel & Wire Co.

Mineral States Exhibit, so far include:

Illinois	Montana
Tri-State Lead & Zinc District	Texas
Lake Superior Iron Ore District	Utah
	Wisconsin

The annual meetings of the Western Division have been held at far Western points, and this is the first time in several years that the meeting has been held at such a central location as Chicago. Such a central convention gives all districts an opportunity to attend, and it is anticipated that a large number of producers from the iron and copper districts of Minnesota and Michigan, and the Mississippi Valley lead and zinc fields, as well as producers of gold, silver, copper, lead and miscellaneous minerals from the far Western states, and industrial leaders from the Eastern states, will be in attendance. The Division anticipates a record attendance, and the development of the best thought of all groups upon problems of common interest.

Both the convention and exposition will be held at the Palmer House, Chicago, Ill. All sessions of the convention will be held on the same floor with the exhibits.

PRICE DIFFERENTIALS

in the MINING INDUSTRY

*The American Mining Congress Protests Application of
Patman Bill to Natural Resources*

THE following statement is submitted in behalf of the American Mining Congress, an organization representing the various branches of the mining industry of this country.

In submitting this statement we wish to make clear that the American Mining Congress is expressing no opinion as to the desirability or necessity of the proposed amendments to the Clayton Act insofar as they affect chain stores. The mining industry, to the best of our knowledge, neither sells to nor purchases from chain stores, and hence we have no direct interest in the chain store problem. We are, however, vitally interested in the fact that the Patman Bill is so sweeping in its scope as to embrace practically all branches of industry and trade, and that it would result in serious disturbance to the mining and related industries.

It is clear from the testimony of proponents of the bill that the alleged legal and economic wrongs which it seeks to correct lie wholly within the chain store field. However, the remedy they offer is so broad as to include all commodities in interstate commerce, whether or not they are the subject of trade in connection with chain stores. As has been jocularly remarked, the proponents of the bill, instead of using a rifle to hit their mark, have chosen to fire a shotgun, with all the attending damage usual to the use of a blunder-buss.

It would seem fundamental that any changes in existing law should be directed toward the particular fields in which abuses are claimed to exist, and that in other fields of activity, where it appears that the existing law is reasonable and adequate, it should be left unchanged.

Although it is submitted that there is no necessity for the Patman amendment to the Clayton Act insofar as the mining and similar heavy industries are concerned, it might be well at this point to note some of the ambiguities which characterize this proposed amendment. It appears that the proposal is susceptible of interpretations which would render its several parts, particularly the provisos, inconsistent with each other.

It will be noted in the first part of the first proviso, that differentials in prices as between purchasers depending solely upon whether they purchase for resale to

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Statement of Julian D. Conover,
Secretary,

American Mining Congress
Before the House Judiciary Committee,
on the Proposed Patman Amendment
to the Clayton Act (H. R. 8442)
July 17, 1935

* * *

wholesalers, to retailers, or to consumers, or for use in further manufacture, are permitted; and in the last part of the same proviso, that differentials which make only due allowance for differences in the cost of manufacture, sale or delivery resulting from the differing methods or quantities in which such commodities are to such purchasers sold or delivered, are also permitted. The first part of the proviso evidently means that price differentials may be granted as between differing trade classifications; in other words, that a different price may be granted to wholesalers, retailers, or those buying for further manufacture, but it would appear that all buyers within each particular classification must receive the same price; on the other hand, in the last portion of the proviso, price differentials based on differences in cost of manufacture, sale, etc., are permitted. It thus appears that the first provision requires a standard of equality of price within each trade classification, which would conflict with the application of the second proviso, making possible price differentials based on differing cost factors.

Furthermore, the proposal for a further proviso, to the effect that the preceding provisos shall not be construed to permit differentials based on differences in quantities greater than carload lots, is so sweeping in its provisions as to nullify at least one, if not both of the preceding provisos, and virtually abolish all quantity price differentials in interstate commerce.

These drastic limitations, applied to all branches of industry and trade, would amount to a total abrogation of a long-established business practice, with attendant hardship and confusion. Price differentials based on quantity, we submit, are fully warranted by sound business principles. To prohibit such practice generally and make it unlawful

would deprive both sellers and buyers, in large number, of perfectly legitimate benefits which they now enjoy and to which they are justly entitled by the recognized laws of trade.

The economic justification of such differentials is so apparent that detailed discussion is hardly needed. The benefits to the producer of large-quantity sales are many, including not only reduced costs of production, reduced selling and distribution expense, reduced collection expense, etc., but in many cases the ability to schedule operations with reasonable continuity, without which it would be difficult or impossible to operate at all. Consider, for example, a coal mine which disposes of a large tonnage through contracts extending over a considerable period. This assured outlet enables it to plan its operations systematically, keep its organization together, and give steady employment to its men—a result which could not be attained except by its ability to quote a more attractive price on large contracts than it could possibly quote on small-lot business. The sales are made to consumers in both instances, but certainly there is no similarity between a contract calling for a million tons, involving shipment of one or more trainloads each day, on the one hand, and an occasional car lot order on the other.

The proposed carload lot limitation is itself extremely indefinite as to many mineral commodities, since railroad tariffs provide for different minimum weights on the same commodity to different points, and even provide different minimum weights on the same commodity to the same point at different rates. The variation may be as much as from 30,000 to 110,000 pounds, and the minimum carload quantities are constantly being changed. Furthermore, the greatest confusion would result from the fact that there are very few mineral products which are sold on the basis of carload lots, and the carload lot provision would be extremely difficult and unfair of application where the long-established unit of sale is not the carload, but is measured in pounds, tons or even in cargo lots.

Even if the carload lot proviso is deleted from the proposed amendment, the provisions of the amendment remain im-

practicable from the standpoint of the mineral industry, since in order to justify price differentials an involved mathematical calculation would be necessary to ascertain the "due allowance" arising from cost factors. In numerous cases intangible factors, such as credit risks which are not subject to exact determination, may very well prove a decisive factor in establishing differences in price. Frequently, also, the ability of a producer to dispose of the major part of his output under large quantity contracts is the determining factor which makes possible operations of his mine or plant on any scale at all. The "due allowance" for difference in cost of production under such conditions, as compared to the hypothetical cost if no such "back-log" of business were to be had, is plainly impossible of determination. It must be borne in mind that there is no more controversial field of accounting than that relating to costs; and it would be manifestly unfair to require sellers of raw materials to assume the burden of proving that every price differential is related with mathematical accuracy to cost differences.

At the time of the enactment of the Clayton Act in 1914 extended consideration was given to Section 2 on the question of price differentials based on difference in the grade, quality or quantity of the commodity sold. In the reported cases which have involved Section 2 it is very evident that while the Courts have been ready to enforce any infraction going beyond the permissive rights contained in the Act, they have accepted the economic justification of differentials in price based on difference in grade, quality or quantity.

A growing body of judicial interpretations has led to an understanding on the part of industry in general as to its rights and limitations with reference to price differentials. Now to make such a far-reaching change as the Patman Bill proposes would inevitably create a period of great uncertainty as to the terms of any new law and would be most disturbing to industry in adjusting itself to such a wide divergence from long-standing, reasonable and justifiable practices which are already limited by law.

The decision of the Supreme Court in the case of *George Van Camp & Sons Co. vs. American Can Company*, et al (278 U. S. 245), decided in 1929, removed the effect of lower court decisions which had blocked the Federal Trade Commission from prosecuting price discrimination in favor of chain stores (See page 64, Final Report of Chain Store Investigation).

A further milestone in extending the limits of the application of Section 2 of the Clayton Act is found in *American Can Company vs. Ladoga Canning Company* (C. C. A. 7; 1930) 44 F. (2d) 763; certiorari denied 282 U. S. 899. Here it was held in substance that large discounts and other favors given one canned

goods packer by a can manufacturer, not given other packers, attended by secrecy of dealings and failure to advise the other packers, are not justified by the claim that the first packer's business was so large as to justify such special discounts, particularly where it was not shown that the other packers had an opportunity to benefit from similar discounts for large quantity purchases.

These two cases alone have set forth clearly the lines beyond which business cannot go in establishing price differentials, and it is believed by many lawyers that these limits are adequate to bring within the regulation of the Federal Trade Commission even the practices complained of in the chain-store field. It is significant, in connection with the proposal for the virtual abolition of quantity price differentials in all lines of interstate commerce, that the Federal Trade Commission in the final report heretofore referred to states (page 65):

"So far as commerce and competition on the part of manufacturers are concerned, it does not appear that the discrimination has resulted in any tendency to monopoly."

In the event your honorable committee should determine that there should be any amendment to Section 2, it is submitted that:

(a) Any further restrictions upon price differentials, if considered necessary, should be limited to the field in which chain stores operate, to which field we understand that the bill was originally intended to be applied.

(b) That basic raw materials, particularly those which are the products of mines, should be excepted from the operations of any such amendment.

(c) That in any event existing contracts based upon such differentials should be excepted from operation of any such amendment.

(d) That in any event consideration should be given and exceptions made so as to permit needed differentials to meet competition from foreign imports.

Finally, there are good grounds for concluding that no change in Section 2 of the Clayton Act is needed, since it is so inclusive and definite, particularly as the same has been interpreted by the Courts, as to make possible the correction of all the abuses claimed; but as indicated above, if there is to be any amendment, the foregoing points should be adequately covered.

Wheels of Government

(Continued from page 11)

After having the Guffey-Snyder bill before them for several weeks, the subcommittee, under the leadership of Representative Sam Hill of Washington, submitted the result of their work to the full committee on Ways and Means

without report. The bill as tentatively rewritten provides for an "excise" tax on the f. o. b. mine price of 15 percent in place of the former 25 percent, and for a drawback to those complying with the code of 90 percent in place of the former 99 percent. The board is reduced from nine to five members all of whom are to be impartial men from outside the industry. The section covering railroad track connections to mines as well as the section denying the use of the mails and other communication facilities, is withdrawn. Title II, known as the Federal Land Purchase feature, is eliminated.

Beyond question the bill will be further rewritten and in its final form, at least for this session of the Congress, may provide only for a five-man commission, a fact-finding staff with authority to procure facts and such labor provisions as can be agreed upon by the representatives of the coal mine workers and the producers of bituminous coal.

The National Labor Relations Act, S. 1958, known as the Wagner bill, was approved by the President July 5. In the intervening space of time the membership of the new board has not been appointed. The American Federation of Labor has issued a message to its members advising caution in proceeding under the terms of the act and as yet there has been practically no information as to any procedure under the terms of the law.

The Economic Security Act, H. R. 7260, remains in the hands of the conference committee after a test on the floor of the House of Representatives in which that House maintained its opposition to the Clark amendment exempting private pension systems from the tax provisions of the administration bill.

The Public Utility Act of 1935, H. R. 2543 (Wheeler-Rayburn bill) also remains in conference committee, with the "dissolution clause" or so-called "death sentence" flatly refused by the conferees for the House of Representatives.

A most ill considered legislative attempt now lies in the Committee on the Judiciary of the House of Representatives, namely, the Patman bill, H. R. 8442, amending the Clayton Act in regard to price discrimination between purchasers. This bill, written for the purpose of curbing the chain stores industries, was amended by Representative Patman (Dem., Texas) to prohibit quantity price differentials based on quantities in excess of one carload. As written the bill was so broad in scope that it would include all natural resource products and it was necessary for the American Mining Congress to make a statement before the Committee on the Judiciary, pointing out the harmful interferences which would result from the enactment of the bill as written. The detail of the statement appears elsewhere in this issue.

The Use of the Hitch Drill

By F. M. SCHULL*

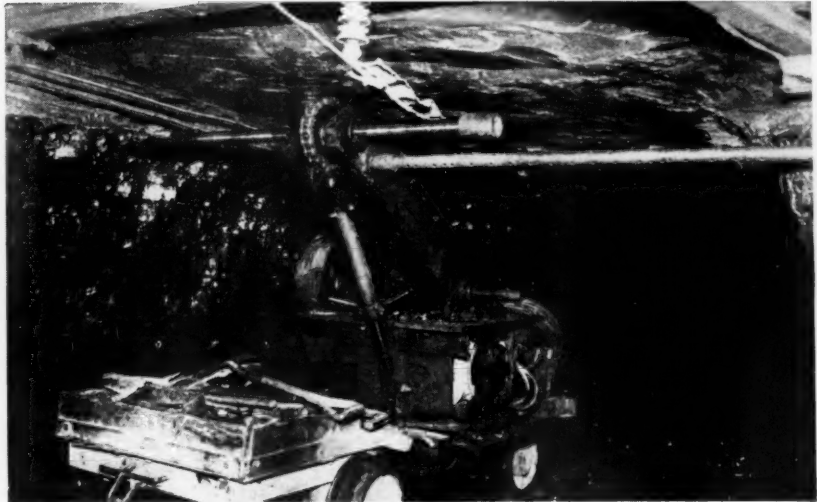
LIKE many other pieces of modern machinery, the hitch drill was perfected due to necessity, because of the unsafe and costly ways of timbering.

Up until 1929 the cross-bars at our No. 8 mine were supported on wooden legs or hitched into the ribs with picks—six inches being the deepest these hitches could be cut into the rib with picks. This was not only a costly, but an unsafe manner of timbering. Frequently, these hitches broke out because they were not cut deep enough into the rib, and we also experienced some mean wrecks caused by the rolling stock leaving the rails, knocking the legs from under the cross-bars, thus releasing tons of slate and endangering the lives of the workmen, to say nothing of the loss of tonnage and the expense of cleaning up the wreck. Cross-bars supported on wooden legs were never permanent, as on main lines the average leg, if not treated, would eventually have to be replaced.

In casting about for something to replace this method of timbering, we examined two other hitch drills, but discovered that in addition to being quite expensive, they would not stand up under ordinary mine handling, so we decided to build a machine according to our own ideas, which was later patented.

This machine is mounted on a truck, the wheels fixed rigidly on the axles. It is propelled from place to place by a 7 hp. motor through a sprocket and chain drive. However, on long moves, we hook the drill behind a haulage motor; in which case the propelling mechanism is thrown out of gear by a clutch.

The drill proper is anchored to a turn-table which revolves on roller bearings about a king pin. This pin holds the table centered on a heavy base, which can be slid cross-wise of the truck, thus adding to the reach of the drill. The front and rear edges of the plate are held by guide channels, and movement is accomplished by two ropes on a windlass shaft under the truck. A 25 hp. motor, regulated by a controller, drives the drill through a sprocket and chain, and speed reduction is by a pinion and gear drive. The drill is mounted on the end of a boom, which is raised and lowered by a steel cable and hand-operated,



worm-driven reel. Once elevated to the desired position, the boom is supported by a screw-jack beneath it. There is no differential between rotation and feed, as both motions are effected simultaneously by a positive feed. A 2½-in. splined thread-bar, of chrome nickel steel, is rotated by a key in the bore of the chain sprocket, and two heavy nuts, one on each side of the sprocket, guide the feed.

The average speed of the drill is approximately 120 r.p.m. Drill steel 1¼-in. square, is fastened to the thread bar by a heavy socket sleeve, and one or more intermediate sections can be similarly mounted to extend the reach of the drill. The boring end of the drill is comprised of two parts; the pilot, or auger point, is forged at the end of the drill steel, and the other is an 8-in. or longer, rectangular block, depending on size of hole desired, that is held on the drill steel by a seated set-screw. In this block are inserted ordinary cutting machine bits, and the drill is held in position by a horizontal telescopic jack.

Two holes can be drilled without changing the position of the machine, one on each side of the entry. The first hole having been drilled, the bit is placed on the free end of the thread-bar, the boom is moved to the opposite side of the entry, the horizontal jack is set, rotation of the drill reversed and the second hole is started. In this manner no time is lost in feeding out the thread-bar or swinging the drill through an 180 degree arc, which is necessary when drilling can be done on only one end

of the thread-bar. Only in moving from one drilling location to another is the turn-table revolved, and then only 20 degrees, and this permits the drill boom to travel within the clearance of the heading. It also saves time which, otherwise, would be consumed in centering the thread-bar.

There are several ways in which timbering can be done after the hitch drill. One is to drill holes on opposite sides of the entry, one hole being drilled three feet and the other eighteen inches in depth. The reason for the deeper hole is so that the bar can be shoved to the back end of same and then, after the bar is raised to position, it can be moved 18 in. into the shallower hole which allows an 18-in. support on each rib. In timbering across break-throughs, or room-necks, the collar-bar rests on pegs of 90-lb. rail, sunk and cemented, or braced, in a hole in the rib, approximately 5 ft. deep. About 12-in. of the rail protrudes from the rib of the entry.

I am of the opinion that it would be more economical to do all timbering by using pegs, allowing the long bar that parallels the entry to rest on two or more pegs and the cross-bars would rest on top of these bars, flush with the roof. Especially would this be true in rooming entries or short life entries, where these bars would all be of uniform length and could be easily and safely removed and recovered. For those who still prefer the wooden cross-bar, will say that the hitch holes can be drilled any size desired. Also, in timbering

(Concluded on page 40)

* General Superintendent, Binkley Mining Co.

NOTE: Prepared and read by Mr. Schull, before the Indiana Coal Mining Institute, at Terre Haute, Ind., December 15, 1934.

MINING METHODS

In Arizona Copper Mines

By J. P. HODGSON*, G. B. LYMAN†

W. CRAWFORD‡

Phelps Dodge Corporation
Copper Queen Branch Bisbee, Arizona

Phelps Dodge Corporation
New Cornelia Branch Ajo, Arizona

Miami Copper Company
Miami, Arizona

Nevada Consolidated Copper Company
Arizona Division—Ray Mines, Ray, Arizona

Inspiration Mines
Inspiration, Arizona

THE present company operations of the Copper Queen Branch of Phelps Dodge Corporation are limited to the Junction, Campbell and Cole shaft areas. Lessees, however, are working several of the older properties in the vicinity of Bisbee and Don Luis.

ORE DEPOSITS AND OCCURRENCE

The ore deposits of the Warren Mining District are of two general types, the sulphide replacement bodies in limestones of Cambrian and Paleozoic age, often associated with igneous intrusions, and the porphyry ores which are disseminated, secondarily enriched ores in granite porphyry. The deposits in the Junction and Campbell areas are of the limestone type, and may be described as irregular bodies of ore in limestone, and on contacts between limestone and porphyry. Most of the ore lenses are associated with well defined fractured zones. The ore shows a marked variation in physical characteristics, ranging from the soft oxide and porphyry ores to the exceedingly dense and siliceous sulphides. The ore deposition and geologic structure have been influenced and greatly modified by several periods of faulting.

DEVELOPMENT OPENINGS

The main working shafts in service are the Junction, a five compartment shaft, 2,727 ft. deep; the Campbell, a three compartment shaft, 2,321 ft. deep; and the Cole, four compartments, 1,493 ft. deep. Both Junction and Campbell shafts are lined with reinforced concrete, and the Cole shaft is timbered. Shafts which are idle, but are at present used for ventilation, are the Briggs, 1,630 ft. deep, the Saginaw, 1,752 ft. deep, and the Hoatson, 1,680 ft. deep.

Levels are driven approximately 100 ft. apart, except below the 2,300 Junction, where the level interval is 133 ft. Motor haulage levels are established 200 ft. apart and are the even-numbered levels. The odd-numbered levels are used for prospecting and stoping.

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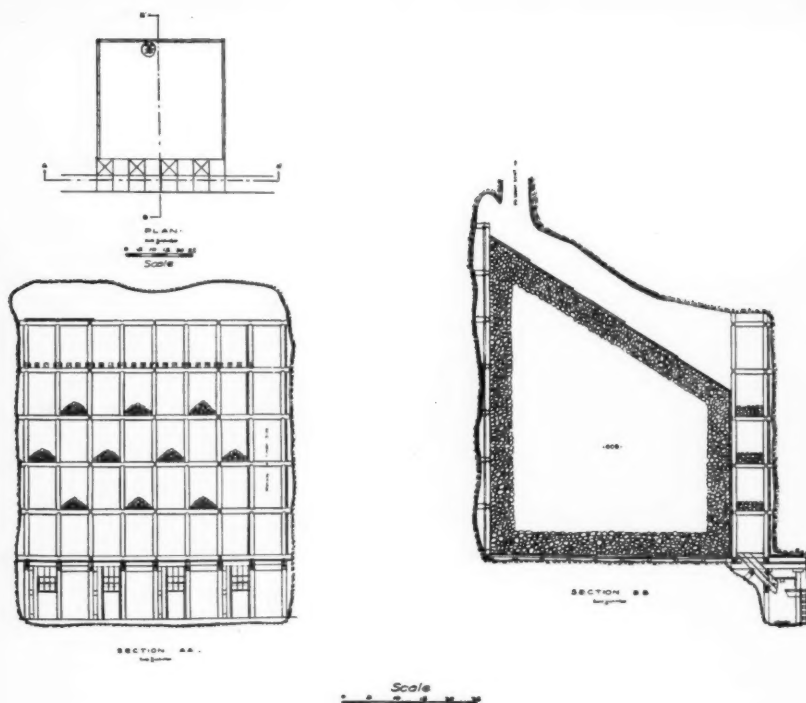


Plate 9

Drifts and crosscuts average 6-½ ft. by 8 ft. in cross-sections and are untimbered, except in heavy ground. Guniting is extensively used in drifts to reduce ground sloughs and as a substitute for timber.

Raises are of three general types, depending upon the use to which the raise is to be put and upon the character of the ground.

1. Cribbed, where ground conditions require, and for extraction purposes. Four-in., 6-in. and 10-in. cribbing is used and the raises are driven with either single or multiple compartments, each compartment being 4 ft. 2 in. square in the clear.

2. Standard 6 or 8 post raises are used principally for travel and supply purposes out of stope lead sets and for main travel ways between levels.

3. Stull. This type is in most general use where ground conditions permit.

Diamond drilling is used as an aid in prospecting and for drainage, and is done on contract. Most of the holes are less than 200 ft. in length and are drilled in the vicinity of known mineralization.

At present, about 2,600 ft. of drifting and raising, and 850 ft. of diamond drilling, is driven each month. These figures do not include development work driven by Lessees.

MINING METHODS

Mining methods are of three types: inclined cut and fill, Mitchell slice, and square set. The great variety of ore occurrences in the district, and the equally variable character of the wall

rock in the vicinity of the orebodies, render any uniformity of stoping methods impossible. Among the factors determining the stoping method to be used are: the physical characteristics of the ore and adjacent country rock, whether selective mining must be done, and the shape and dimensions of the orebody. The inclined cut and fill is the method in most general use.

INCLINED CUT AND FILL

Before stoping is started in an orebody, development crosscuts and raises are driven to determine the size and shape of the ore zone. Development work may be laid out to conform to an established sectionalized plan dividing the orebody into stope and pillar sections, as in the Campbell mine; or may be planned to prospect the ore and be later used in stoping, as in the more irregular orebodies of the Junction mine. In general, the development plan is to drive a main extraction drift parallel to the long axis of the orebody and then drive crosscuts normal to the main drift, at about 50-ft. centers, through the ore. The ground above the crosscuts is cut out to make room for stringer sets.

Plate 9 shows a typical inclined cut and fill stope, with lead sets for extraction, and with single rows of caps protecting the ore on the sides and end of the stope. If the width of the orebody is not excessive, it is mined from wall to wall but where this results in too long a stope, it is divided by a single row of posts and caps.

Posts 9 ft. 8 in. long are used for stringer sets, and the faces of the posts

are set 30 in. from the center line of track. The bottom end of the post is sunk 6 in. below the rail elevation and 6-in. by 10-in. squeeze blocks are placed on top of the posts. The stringers, which are 10 in. by 12 in. in cross-section, are placed with the greater dimension vertical and average about 13 ft. in length. The sets are 6 ft. apart center to center.

After the stringers are in place, chutes are built in alternate sets and mining operations begin. The stringers are covered with 3-in. or 4-in. flooring; and 10-in. by 10-in. sills, 12 ft. long, are laid on the flooring. Standard 10-in. by 10-in. posts, 8 ft. long, are used in the lead sets. A fill raise is driven at the foot-wall end of the stope for filling and ventilation. In a flat bottomed stope, ore from the first cut and from the raise is dragged to the lead sets by a slusher hoist and drag scraper. The back of the first cut is shaped for the initial fill.

On completion of the first cut, the ore is cleaned out by drag scrapers, and the bottom of the stope is covered with a timber mat of scrap timber, which is sometimes laid on sills. Ore on the sides or end of the stope is protected by single rows of standard caps and posts, lagged on the fill side. The lead sets are lagged on the fill side and the stope is ready for gobbing. Waste is dropped through the fill raise and the stope is filled to within 2 or 3 ft. of the back. Fill is allowed to assume the natural angle of repose or about 37 degrees. On completion of filling, 2 by 10 or 2 by 12-in. floor boards, 10 ft. long, are placed on the fill with the ends overlapping. In laying the floor, care is used to avoid hollow places under the floor boards.

Grizzlies of 10-in. by 10-in. timber, spaced about 10 in. apart, are placed in the lead sets at the intersection of the fill floor line and lead sets. As stoping progresses and the lead sets are raised, a checkerboard of old grizzlies and flooring is placed in alternate sets to check the fall of ore from the grizzly floor. These help to protect the chutes and lead set timbers.

Drifter type machines, both automatic and crank feed, are used in drilling 7 to 8-ft. holes. The back of the stope is shaped by drilling holes parallel to the floor angle. Hand rotated stopers are used in driving raises and lead sets.

Thirty and 40 percent gelatin powder with safety fuse, and 8X detonators, are used in blasting.

MITCHELL SLICE

The Mitchell slice is used in mining some pillars and ore which is too soft or broken to mine by inclined cut and fill. Descriptions of this mining method have been published by M. J. Elsing and P. D. Wilson. The ore is mined in sections 15 ft. wide. Two parallel rows of square sets at 20 ft. center to center and the length of the section to be mined are raised to the top of the ore or to the level above. A slice is removed over the whole top of the 15-ft. intervening pillar, or section, the back of the stope being held by segment sets resting on stringers extending between the opposite

rows of square sets. Underhand stoping is begun and the ore is extracted through the square sets. Grizzly sets are lowered as mining progresses. Fifteen-foot stringers are placed across the open stope to hold the square sets, and stope corners are held by diamond braces. Upon the completion of mining, the fill side of the lead sets is lagged and waste is dropped into the stope. As filling progresses, the stringers are removed, to be used again.

SQUARE SET STOPING

Square set stoping is used to a limited extent in mining soft oxide and sulphide ores, small irregular pillars, and ores requiring very selective mining. The sets are 6 ft. center to center with standard 8-ft. posts. As the ore is removed, the sets are filled with waste.

Waste for stope filling is obtained from current development work. Waste is hoisted at the Junction shaft in cars, and storage and transfer raises distribute it to the levels where it is needed. No waste is hoisted to the surface.

MECHANICAL LOADING

In many of the stopes, the floors dip at a high angle allowing the ore to slide into the lead sets. On floors dipping at low angles, and in cleaning up stopes before filling with waste, the ore is moved by drag scrapers and slusher hoists. Both air and electric slusher hoists are in use and are of the same type. Slusher hoists are double drum, 7-½-hp., with roller rope guides, rope guards, and turntables. Both air and electric hoists have a tail rope speed of 175 ft. per minute, and a pull rope speed of 124 ft. per minute. The electric slusher hoists operate on 220 volts, a.c. current. The scrapers are designed to handle heavy sulphide ore and are made in the company shops.

All ore and waste from development work and from stope and raise sills are loaded by Eimco-Finlay loaders, nine such loaders being in use at present.

DRILLING

Three types of drilling machines of various makes are in use. Light and heavy Leyner type drifters, both automatic and crank feed, are used in crosscuts and the hardest stopes. Hand rotated stopers are in use in both raises and stopes; and hand held pluggers are used to drill boulders in stopes and in some development work. No mounted pluggers are in service. Drill columns and arms, 3-½ in. in diameter, are standard equipment. Line oilers are used on all machines and air hoists.

Hollow, round steel, 1 in. and 1-¼ in. in diameter, is used. The pluggers, stopers, and most of the drifters have chucks for 1 in. steel; and the heavy drifters have chucks for 1-¼-in. steel. Six changes of steel, at length intervals of 15 in., from 2 ft. 6 in. to 8 ft. 9 in. are standard. Starter bits with 1-¼-in. steel are 2-1/16-in. gauge, and the gauge decreases ⅜-in. each for two changes and then 1/16-in. each for the last four changes. On 1-in. steel, the starter bits

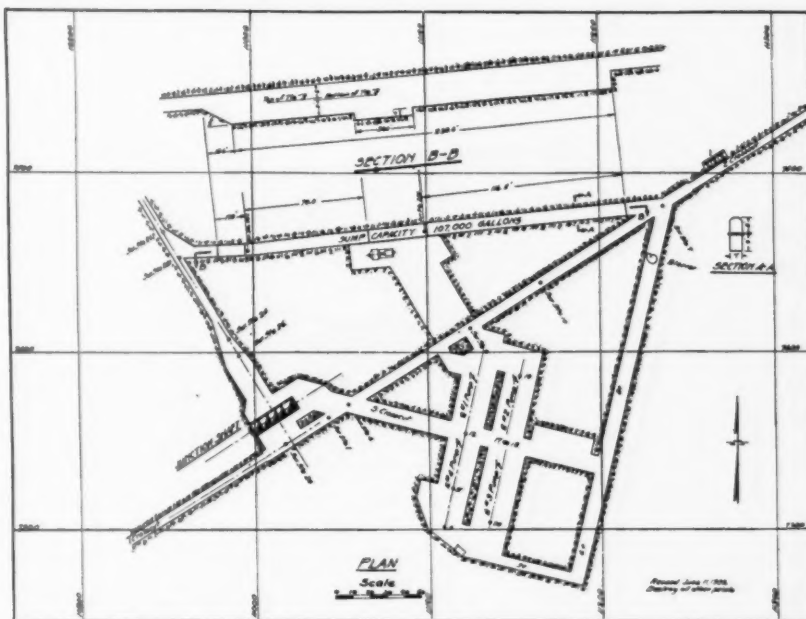


Plate 10

are 1-⅞-in., and the gauge changes are the same as for 1-¼-in. steel. About 1,550 pieces of steel are sharpened daily.

HAULAGE

Mechanical haulage is used on all levels. Trolley locomotives, of 3-½ tons, 250-volt, direct current, are used on the main haulage levels from the 1,400 to the 2,200 in handling ore and waste. Storage battery locomotives of 1-½ tons are used on intermediate levels and for gathering purposes on main haulage levels. One 3-ton storage battery locomotive is in use on the 2,000 level. These locomotives are serviced at underground charging stations. On the surface, a 5½-ton storage battery locomotive is used to transfer supplies from the Junction to the Campbell shaft.

Two types of cars are in service. On the haulage levels, 38 cu. ft., saddle back, side dump cars, equipped with automatic couplers are used for ore haulage. Flat-bottomed, end-opening cars of 16 cu. ft. capacity are used on both the intermediate and haulage levels for waste and ore haulage. Most of the cars have roller bearings.

Mine track is laid with an average grade of 4 in. to 100 ft., in favor of the load, and a gauge of 18 in. Twenty-five-pound rail is used for trolley locomotive haulage and 12-pound rail for other tracks.

HOISTING

The Campbell shaft is the downcast ventilation and hoisting shaft for the Campbell area, and is a 3-compartment, concrete lined, vertical shaft 2,321 ft. deep, with two compartments 5 ft. by 4 ft. 7½ in. and one compartment 5 ft. 3 in. by 10 ft. 8 in. As the shaft is oval in shape, there is also a space of about 14 sq. ft. between the large compartment and the shaft wall, which is

used between lower levels for pipe lines and the pump column. It is connected to the Junction on all levels from the 1,300 to the 2,300 with the exception of the 1,500 level, and it is also connected to the Briggs, Cole, and Saginaw shafts for ventilation. The larger compartment is used for ventilation and, between lower levels, for the spillway hoist. Men, supplies and ore are hoisted through the two smaller compartments. Men are handled on triple-deck cages, and the top deck of each cage is replaceable by a skip for ore hoisting. Supplies are transferred on the surface from the Junction and are lowered, without rehandling, in "Scott" timber trucks.

The Campbell hoist is a double drum, geared, electric hoist, driven by a 1,350 hp., direct current motor. Direct current for the Campbell hoist, and for both Junction ore and service hoists, is made by three flywheel generator sets. The drum diameter of the Campbell hoist is 10 ft., and the rope speed is a maximum of 2,000 ft. per minute. The diameter of the hoisting cable is 1½ in. Ore is hoisted in 5-ton skips from an ore pocket below the 2,200 level, which receives ore from the upper levels through a series of transfer raises.

The Junction shaft is a 5-compartment, concrete-lined, vertical shaft, 2,727 ft. deep, and is the hoisting and downcast ventilation shaft for the Junction area. It is also the main pumping shaft for the district. Four compartments are used for hoisting and the fifth is for water columns, air lines and electric cables.

The Junction skip hoist is a double drum, geared, electric hoist driven by a 1,500 hp., direct current motor. The drum diameter is 12 ft. and the rope speed 2,000 ft. per minute. The diameter of the hoisting cable is 1½ in. Ore is hoisted in 5-ton skips from ore pockets

The Junction service, or "dinkey" hoist, which is used to handle men, supplies, and waste, is a double drum, geared, electric hoist driven by a 450 hp., direct current motor. The drum diameter is 7 ft. and the rope speed is 1,500 ft. per minute. The diameter of the cable is 1½ in. Double deck cages, with flat bonnets, are in use.

Three air compressors in the Junction power plant furnish air for mine and surface use. The compressors are all of the same type and size, each being a twin angle compound driven by a 700-hp., a.c. motor, direct connected, and with a capacity of 4,400 cu. ft. of air per minute (sea level datum).

The mines are ventilated by fans on several of the Junction and Campbell levels. The Junction and Campbell shafts are downcast and the air is exhausted through the Saginaw, Briggs, Hoatson, and Cole shafts. The volume of downcast air is about 220,000 cu. ft. per minute. A new blower station is under construction on the 2,200 level of the Junction and this installation, when complete, will replace several of the other fans. The new fan will be an aero-vane type, belt connected to a 150-hp., a.c. motor, and will deliver 140,000 cu. ft. of air against a 4-in. water head.

Temperature and humidity readings are made in each working place monthly. A systematic plan of air sampling has been developed and close studies are made of air conditions throughout the mines.

The Junction is the main pumping shaft for the district, and water is pumped from the 2,200 level to the surface in one lift. The installation on the 2,200 level has a total capacity of 6,955 g.p.m., and consists of four motor-driven plunger pumps and one motor-driven centrifugal pump. (Plate 10.)

A 6-stage, centrifugal pump, driven by a 1,750-hp. motor is used as a standby. It is rated at 2,200 g.p.m. at 2,350 ft. total dynamic head and, with a single-stage booster, is delivering 2,280 g.p.m.

The pump columns, of which there are two, are pipes 12 and 14 in. in diameter, the thickness of the column walls varying with the depth below the surface. The thickness at the 2,200 level is 1 in. and reduces by stages to $\frac{3}{8}$ -in. at the surface. Clean water from the 2,200 level and below is pumped through one column, and dirty water originating above the 2,200 level is pumped through the other column. There are two sumps, one above the station pump for dirty water, and one below for clean water. Water from the 2,300 level and below is relayed to the 2,200 level.

Acid water originating above the 1,800 level is treated in two cementation plants on the 1,500 and 1,800 levels. Water samples from all sources are taken regularly for analysis.

Emphasis is placed on the maintenance of safe working conditions for underground and surface employees. Safety work is in charge of a safety inspector, with committees from the different departments acting in an advisory capacity.

Employees are required to wear protective clothing such as safety hats, hard-toed boots or shoes, and goggles.

Fuse is cut into lengths and capped on the surface, and is delivered daily, together with powder, to underground magazines. Supplies of explosives are handled to the magazines between shifts.

ORE OCCURRENCE

The outcropping of the orebody is roughly circular in shape and about two-thirds of a mile in diameter. The average thickness, including ore mined, is 425 ft., and the maximum thickness nearly 1,000 ft.



On the average, the ore is very hard and breaks into large boulders on account of widely spaced fracture planes. Waste and overburden is, in general, softer than the ore.

PRELIMINARY EXPLORATION

Preliminary development was done almost exclusively by diamond drilling. Most of the holes were drilled vertically downward at the corners of 200-ft. squares, although in later work, a 400-ft. interval was used.

In order to check the diamond drilling, test pits were sunk on some of the drill holes. These were sampled and averaged slightly lower than the drill holes. Some checking was done by means of drifts driven from the bottom of some of the deepest pits and by raises from these drifts.

All mining at present is being done in an open pit by means of steam shovels. The shape of the pit is roughly elliptical with the major axis pointing northwest-southeast, and is 3,600 ft. long by 2,500 ft. wide. The height of the benches varies from 15 to 35 ft. New levels, however, are being opened up by 25-ft. benches. The average slope of banks is 50 degrees from the horizontal; however, 25-ft. banks will stand nearly vertical in average ground if properly trimmed.

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square is available for the purpose. The dump material contains about 0.30 percent copper.

Drilling—Both primary and secondary drilling are done with hammer drills exclusively. Wagon type drills and heavy jackhammers suspended from tripods are used in primary drilling, and lighter jackhammers without mountings in secondary drilling.

Drill steel is 1½ in. round for the heavier drills and ¾-in. hexagon for the lighter drills. Detachable bits are used with all drill steel.

All bench holes are drilled to 2 ft. below grade. Spacing of holes varies with hardness of the rock and ranges from 10 ft. in the hardest ground to 20 ft. in the softest. The arrangement of holes for a standard 25-ft. bench is shown on Plate 12.

Blasting—All holes are sprung with 1½-in., 50 percent gelatin stick powder. Main charges consist of 40 percent strength granular powder, known as Quarry Special No. 1, in dry ground, and 1½-in., 40 percent gelatin stick powder in wet ground. Boulders are block holed and blasted with small amounts of 40 percent gelatin powder. During the year 1934, the powder consumption amounted to 0.25 pounds per ton.

Loading and Transportation—Ore and waste are loaded by means of 105-ton, formerly railroad type, steam shovels, equipped with caterpillars and 4-yard dippers. They are fueled with oil. For the year 1934, the shovels handled an average of 1,767 tons of material per shovel shift.

Transportation Equipment—Consists of oil-fired steam locomotives, class 0-6-0, and 40-ton cars. Six cars make up a train. The average length of haul during the year 1934 was 1.624 miles.

The air compressor plant, drill sharpening shop and shop for minor repairs, are located near the mouth of the pit.

Air compressor capacity is 6,200 cu. ft. of air per minute at a pressure of 100 pounds per square inch.

Drill steel is transported between the shop and the mine on a specially designed flat car.

SAFETY WORK

Educational work in accident prevention is carried on actively by means of safety committees representing the workmen and also the supervisory staff, as well as by a safety inspector. First aid training of men and bosses is a part of this safety work.

MIAMI COPPER COMPANY

Miami, Arizona

ORE OCCURRENCE

THE mineralization of the Miami Copper Company's orebody consists of chalcocite, replacing or partially replacing cupriferous pyrite, usually occurring in seams or disseminated through schist. The area of the orebody, as

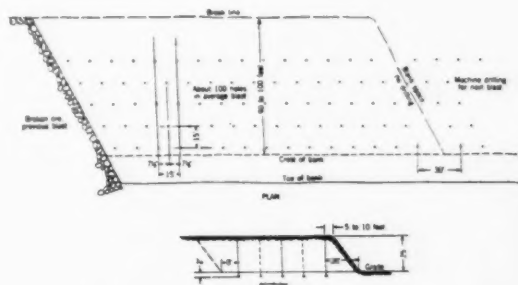
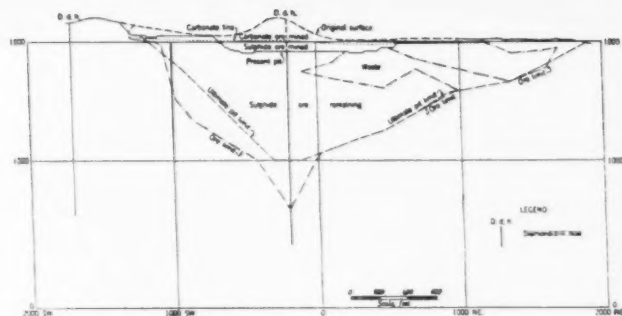


Plate 12

given in 1930, is 100 acres and the average thickness 325 ft. Ore developed to that date amounted to approximately 108,460,000 tons, containing 0.88 percent copper, of which 0.79 percent is sulphide. The leached capping overlying the orebody varies in thickness from 250 to 500 ft. Preliminary exploration work was done by churn drilling.

MINING METHODS

Preliminary Development—Before grizzly and haulage levels can be finally located, it is necessary to determine definitely the boundaries of the orebodies, which has been done at Miami by both churn drilling and underground development work.

Caving blocks are 150 ft. square horizontally and are carried upward to the top of the ore. Plate 13 is an isometric drawing of a caving block 150 by 300 ft. long, but serves equally well to illustrate the method of mining the smaller blocks adopted later as standard.

A haulage drift is driven through the center of the block. At the same time, grizzly drifts, 100 ft. above the haulage level are driven at right angles to the haulage drift. They are spaced 50 ft. apart and are symmetrically located within the block boundaries. Both haulage and grizzly levels connect with the main shafts. Three pony sets, spaced 50 ft. apart are placed over each haulage drift and directly below the grizzly drifts. Transfer raises are driven from opposite sides of the pony set at right angles to the haulage drift. Two branch raises

are driven from each transfer raise to the grizzly level. On connecting to the grizzly level, a series of six openings spaced at 25-ft. centers along the grizzly drift is provided by the raise system from each pony set on the haulage level. For a caving block 150 ft. square, there are 18 such openings, spaced 25 ft. in one direction and 50 ft. in the other direction. At each end of the block, grizzly drifts are connected by a fringe drift.

Grizzlies, consisting of 45-lb. rails spaced 12 in. apart, resting on 10-in. by 10-in. stringers, are placed over the transfer raise opening. Specially constructed grizzly sets are also stood over each opening. Grizzly raises at right angles to the grizzly drift are now driven from opposite sides of the grizzly set. These raises are carried on a 42-degree slope for a distance of 14 ft. and then vertically upward for about 10 ft. The inclined section of the raise is about 3½ ft. in diameter, and the vertical section is enlarged to accommodate the chute set. The chute set consists of a square set with four timbered finger raise approaches. The square sets are rotated so that the horizontal diagonals are respectively parallel and at right angles to the grizzly drift. (See Plate 14.) The sills of the chute set are 11 ft. 6 in. above the floor of the grizzly drift. The height of the set is 7 ft. 2 in. over all. Four finger raises, 3½ ft. in diameter are driven from the square set. These raises are inclined to a point 8.85 ft. from the center of the square and thence carried vertically upward to the undercutting

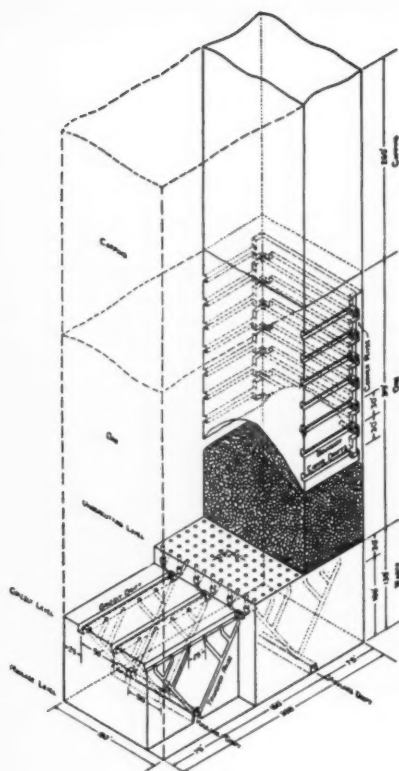


Plate 13

level which they intersect at 12½-ft. spacing. This level is 30 ft. above the grizzly level.

The undercutting level is opened up by driving four small drifts, parallel to the grizzly drifts, through the tops of every third row of finger raises, or at 37½-ft. centers. These drifts are connected at both ends by fringe drifts. Undercutting starts by putting up a shrinkage stope two or three rounds high, over one of the fringe drifts. This stope is usually carried along the side boundaries and the other end of the stope as undercutting of the main block progresses. In order to cut off the caving block from surrounding ore, a series of boundary caving drifts are driven at 30-ft. vertical intervals directly above the shrinking stopes. The main block is undercut by driving large drifts, 8 ft. wide, at right angles to the small, opening-up drifts. The sides and backs of these drifts are drilled and blasted to remove the remaining small pillars and complete the undercut. The tops of finger raises are funneled as undercutting progresses.

ORE DRAWING

In the control of ore drawing operations, there are two principal objects: (1) to obtain a maximum amount of ore with a minimum dilution by waste capping, for which reason an effort is made to draw the ore down uniformly to maintain a contact between ore and capping that will be an even plane, preferably horizontal; (2) to regulate drawing so

far as possible to relieve excess weight on extraction openings, to reduce repair costs and interference with production. In practice, it is necessary to compromise between these two objectives.

Control of drawing involves: (1) drawing the proper chutes; and (2) measurement of ore drawn. All chutes are sealed and tappers are permitted to break the seals only on chutes listed in written orders issued by the stope engineers. Chutes are resealed immediately after drawing. Ore is measured by rotating drawing so that only one chute of the series connecting to a given transfer raise is drawn at one time. The amount drawn is estimated by the tapper who also reports the time at which drawing was done. This is checked by the number of cars reported by the haulage level loading crew, who also report the time at which loading takes place. By coordinating the times of tapping and loading, an accurate measurement is obtained on 75 percent of the ore drawn. The remaining 25 percent is apportioned by estimate based on information at hand.

A production of 18,000 tons per day requires 13 or 14 stopes on the drawing schedule. This is equivalent to about 1,300 tons per day per stope, or 17.06 sq. ft. of area per ton produced daily. At this rate, the corresponding average vertical thickness of solid ore drawn is 0.733 ft.

A comparison of expectancy and actual mining on 13 completed stopes is shown below:

Expectancy		Mined		Percentage Extraction		
Tons	% Cu.	Tons	% Cu.	Tonnage	Grade	Copper
11,038,070	1.0260	12,710,378	0.9124	115.15	88.93	02.40

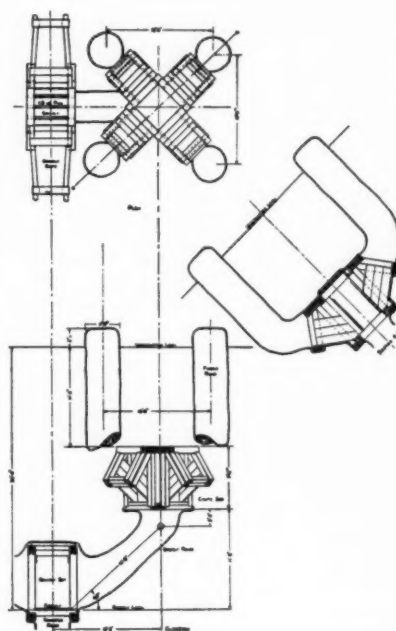


Plate 14

UNDERGROUND TRANSPORTATION

Ore is hauled in trains consisting of 35-gable-bottom cars of 86-cu.-ft. capacity, carrying 3.6 tons each.

Locomotives are 6-ton trolley type and on ore trains are operated in tandem.

Tracks are 24-in. gauge and are laid with 45-lb. rail except in the 1,200-ft. approach to the shaft on which 70-lb. rail is used. The track grade is 0.4 percent in favor of the load.

Each train hauls between 950 and 1,000 tons per shift. The average length of haul is 0.96 mile one way, requiring an average of 56 minutes per round trip.

The cost of ore haulage, including loading, hauling, dumping, maintenance of track equipment and haulage drifts is about 5 cents per ton mile.

HOISTING

Ore is hoisted in 10½-ton skips, a vertical distance of 811 ft. to the crusher plant. After the skips are loaded, they are put in motion through push button control by the skiptender. The acceleration, retarding and dumping of the skips is automatic, no hoisting engineer being required. The hoist is double drum and is driven by two 1,400 hp. motors. The maximum speed of the hoist is 2,250 ft. per minute, and the maximum capacity 950 tons per hour.

Men, supplies and waste rock are handled on a single deck counterbalanced cage in a compartment 6 ft. 6 in. by 13 ft.

Underground hoisting between levels

is handled by one large warehouse type elevator. An automatic elevator with push-button control handles men between levels not connected with the main shaft.

COMPRESSED AIR

Compressed air is provided by a single unit having a capacity of 8,000 cu. ft. per minute.

VENTILATION

Primary ventilation is provided through 3 shafts, of which shafts 3 and 5, both downcast, are concreted. Shaft 4, the upcast, is timbered. A suction fan at the collar of shaft 4 exhausts 130,000 cu. ft. of air per minute, and a blowing fan at shaft 3 handles 60,000 cu. ft. per minute. The combined action of the two fans causes a down draft in shaft 5, the main working shaft, of 70,000 cu. ft. of air per minute. Auxiliary ventilation is maintained where required by electrically driven fans delivering 5,000 cu. ft. of air per minute and compressed air fans delivering 2,000 cu. ft. of air per minute. Flexible tubing, 12 and 18 in. diameter, is used with these fans. Rock temperatures increase 1.5 degrees F. per 100 ft. of depth. During exploration

work on the 2,600-ft. level, the rock temperature was 106 degrees F.

MINE SAFETY

In conjunction with other mines, a fully equipped mine rescue and first aid station is maintained. The personnel of this station gives first aid training and mine rescue instruction to the employees of the contributing companies. A large percentage of employees have taken this training, which is required of all foremen and bosses.

In addition to apparatus at the mine rescue station, emergency apparatus is available at the main shaft collar. Underground first aid stations are located throughout the mine. Other underground safety equipment such as high pressure water lines, fire extinguishers, all service type gas masks, and oxygen cylinders equipped with inhalation masks, are in readiness for use at any time.

NEVADA CONSOLIDATED COPPER COMPANY

Ray, Arizona

ORE OCCURRENCE

THE essential ore mineral in the Ray orebody is chalcocite associated with pyrite, which in some instances it has entirely replaced. Chalcopyrite is also present, but in smaller amounts. The orebody for the most part is in a quartz-sericite schist; a relatively small amount of ore occurs in granite porphyry which, in general, lies outside of the ore zone. The chalcocite is present as disseminated specks and distinct veinlets, usually less than one-half in. thick. The grade of the ore as taken from mill heads for the year 1928 was 1.250 percent total copper, or 1.11 percent sulphide copper.

The orebody is irregular in outlines, occurring as two connected flat lobes. (Plate 15.) Its length along the main axis is about 7,000 ft. The average width of ore is about 1,500 ft., and in thickness it varies from 40 to 400 ft., averaging about 120 ft. The capping is from 40 to 600 ft. thick and averages about 250 ft.

PRELIMINARY DEVELOPMENT

The first prospecting in the Ray orebody consisted of shafts and drifts. This was followed by churn drilling the entire area, holes being spaced at the corners of 200 ft. squares. Further exploration has been carried on underground by diamond drilling, "long hole" drilling with Leyner type machines, and by drifts and raises. Careful sampling accompanied all exploration work.

DEVELOPMENT FOR MINING

Operating shaft facilities consist of two vertical shafts for hoisting ore, one vertical shaft for handling men and two inclined shafts provided with stairways,

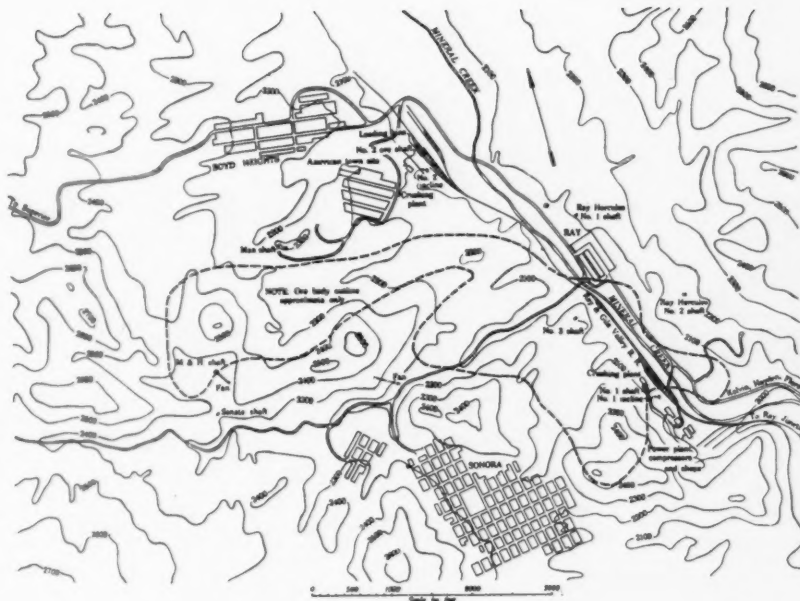


Plate 15

and used for waste, supplies and as emergency exits. Hoisting and man shafts and supply inclines are concreted. Additional concreted shafts have been provided for ventilation. Four main haulage levels of 150-ft. vertical intervals have been developed.

Main haulage drifts are broken 8 by 9 ft. and haulage laterals 8 by 8½ ft. in cross-section. Mucking is done by hand to 5-ton cars. Drift sets consist of 12-in. by 12-in. posts and 12-in. by 14-in. caps. Main haulage sets are 7 by 8 ft., and haulage laterals 7 by 7½ ft. in the clear. In heavy ground, main haulage drifts are concreted.

Sub-level fringe drifts are timbered with 8-in. by 8-in. timber with posts 7 ft. 2 in. long. Sub-level draw laterals are untimbered and about 8½ by 5 ft. in cross-section.

Raises are driven principally in connection with the sub-level method of mining, and consist of storage raises between the haulage level and the sub-level. They are seldom over 30 to 35 ft. long and are never flatter than 55 degrees. Where the ground permits, raises are driven 4 ft. by 4 ft. untimbered. If timbering is necessary, 6 in. by 8 in. cribbing is used, giving an inside cross-section of 4 ft. by 4 ft.

MINING METHODS

Four variations of one general mining method have been developed to apply to particular conditions in the orebody, such as thickness, distance above the haulage level, and other physical characteristics. These variations are known as hand tramming method, motor method, modified motor method and sub-level method.

The hand tramming method is used in mining small bodies of fringe ore too high above the main haulage level to

permit the use of the motor system or modified motor system and not having sufficient vertical thickness to warrant the use of the sub-level method.

The motor method in which the ore is drawn directly into cars on the main haulage level is used when the ore comes down to the haulage level and extends less than 100 feet above it. The ground must be hard and must have no tendency to pack after being caved.

The modified motor method is used in mining softer ground where the height of the ore is less than 100 ft. above the haulage level.

The sub-level method is used in all types of ground where the thickness of ore above the haulage level is 150 ft. or more. It is the preferred method.

As there is no essential difference between the four methods, other than in arrangement of preliminary development work, the sub-level method only will be described. Detailed descriptions of the remaining methods can be found in the references at the end of this article.

In the sub-level method the caving block is usually 200 ft. wide, and has a height of ore above the haulage level of at least 150 ft. Four parallel haulage drifts at 50-ft. centers are driven through the block. Pony sets are installed over every fourth and fifth drift set. Chutes are installed on each side of one of these pony sets, and raises 4 ft. in diameter are driven from each chute to a height of 40 ft. above the rail, at which elevation the sub-level lateral drifts will be driven. The inclination of the raises is such that they intersect the sub-level laterals at 25-ft. centers.

After raising has progressed far enough to give the required connections, the development of the sub-level, 40 ft.

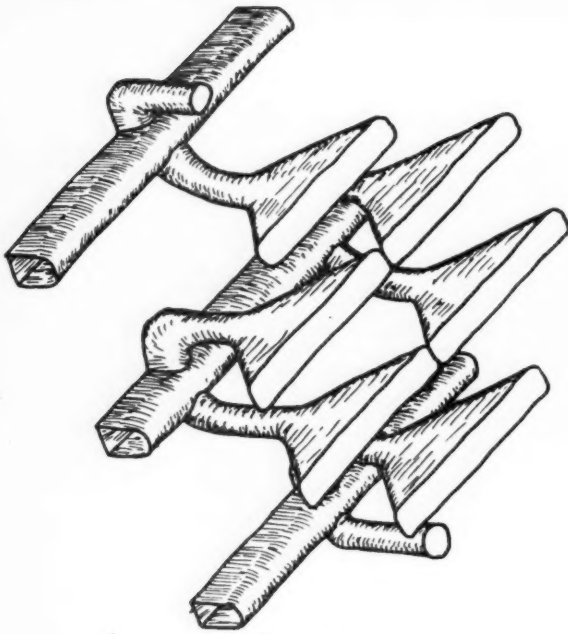


Plate 16

above the haulage level, is started. Small timbered fringe drifts are driven on the boundaries of the caving block. Sub-level laterals, consisting of small, untimbered drifts, are then driven across the caving block at right angles with the haulage drifts and intersecting the tops of the haulage raises. A grizzly set is stood over each haulage raise. Grizzly spacing is 13 in.

Undercutting operations are started by driving "throat raises" from each side of each grizzly set at such an inclination that they are 12½ ft. center to center at a point of 7 ft. above the top of the grizzly set. At this elevation, 45 degree inclined raises are driven parallel to the sub-level lateral from each side of the "throat raise" to a vertical height of 17 ft. above the back of the grizzly set. When these raises have connected across the width of the block, the intervening ground between each pair of raises driven from the same "throat raise" is blasted out (see Plate 16) leaving a slot 4 ft. wide with a level back and a sawtooth bottom extending across the block. Shrinkage stopes are started from the slots and are carried upward over each alternate line of raises to a height of 37 ft. above the top of the grizzly set. These stopes are 6 ft. wide at the bottom, and are belled out to a width of 17 ft. at the top. Over the intervening lines of raises, shrinkage stopes are similarly driven, but to a height of only 30 ft. above the grizzly set. The final round is so drilled that the stopes will break into adjacent shrinkage stopes, thus forming a continuous undercut throughout the area of the block. Except on sides adjacent to caved ground, the caving blocks are cut off on all sides by shrinkage stopes ex-

tending from the undercut level to the capping. Plate 17 shows the spacing of the draw points on the grizzly and undercut levels.

The above method of undercutting has two principal advantages. First, it provides pyramids of solid rock, which tend to support the broken ground and keep direct weight from coming upon the draw sets and drawing off level. Second, the thickness of ore broken during undercutting acts as a cushion and allows more thorough breaking up of caved ore before it reaches the draw points.

Drawing follows closely upon undercutting as it progresses from one end of the block to the other. Stope control engineers supervise drawing operations. An even draw is maintained throughout the blocks.

Since mining operations started, more than 40,000,000 tons of ore have been

bar pull of 3,000 lbs. Tracks are 30-in. gauge and are laid with 35-lb. and 45-lb. rails. The track grades are ¼ to 1-3 percent in favor of the loads.

Trains consist of 20 to 25 cars. The average length of haul is approximately 3,000 ft. Cars are dumped at the shaft pockets by electrically driven tipples, requiring about 10 minutes for a 20-car train. Grizzly spacing at the shaft pockets is 16 or 18 in. A typical shaft pocket holds 570 tons. Stations and pockets are entirely concreted.

Ore is hoisted in 10½-ton skips which dump into a 100-ton steel bin over the coarse crushing plant.

VENTILATION AND FIRE PREVENTION

Primary ventilation is accomplished by three surface exhaust fans having a combined capacity of 157,000 cu. ft. of air per minute, equivalent to about 400 cu. ft. per minute per man employed underground on day shift. The rapid removal of blasting gases, smoke and dust is the principal ventilation requirement.

The danger of fire in main shafts is eliminated by concreting. Fire trucks are kept on each level, and fire hydrants, exit signs and lights are provided throughout the mine.

SAFETY WORK

A safety engineer, familiar with operations and conditions, carries on educational work, instructs men in first aid and mine rescue work, and keeps records of accidents.

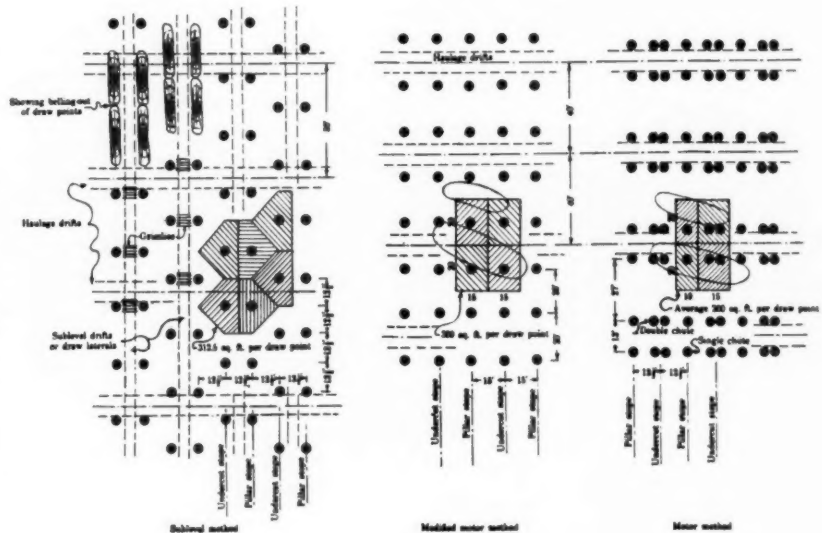


Plate 17

drawn with a grade dilution of about 10 percent.

UNDERGROUND TRANSPORTATION

Standard ore cars have a capacity of 103 cu. ft. and hold an average of 4.6 dry tons. Haulage is by means of 8-ton compressed air locomotives with a draw-

Safety rules covering all phases of the work have been formulated and are posted on bulletin boards. Cash awards are made each month to bosses obtaining good safety records. Educational work is also carried on by the supervisory force and by exhibits, signs, bulletin boards and weekly first aid letters.

INSPIRATION MINES Inspiration, Arizona

ORE OCCURRENCE

IN THE Inspiration deposit, the ore minerals consist of chalcocite, azurite, malachite and chrysacolla, widely distributed through schist and granite. Distribution of these minerals has taken place along cracks and fractures in the ore zone, but in some cases they are disseminated as small specks throughout the rock. The fractures have also been an important factor in the success of caving operations.

The dimensions of the mineable ore zone were given in 1929 as about 8,000 ft. long, with an average width of 800 ft., and an average thickness of 200 ft.

The ore outcrops in some places on the surface and elsewhere, the thickness of capping varies to a maximum of 500 ft.

PRELIMINARY EXPLORATION WORK

Original exploration work was done by churn drilling on the corners of 200 ft. squares. In later years, diamond drilling has been used to determine accurately the limits of the ore zone, and also for prospecting.

Plate 18 shows vertical sections through the orebodies, and Plate 19 plans of orebodies, shafts and haulage levels.

DEVELOPMENT

The mine is operated as three divisions: the Inspiration, Live Oak and

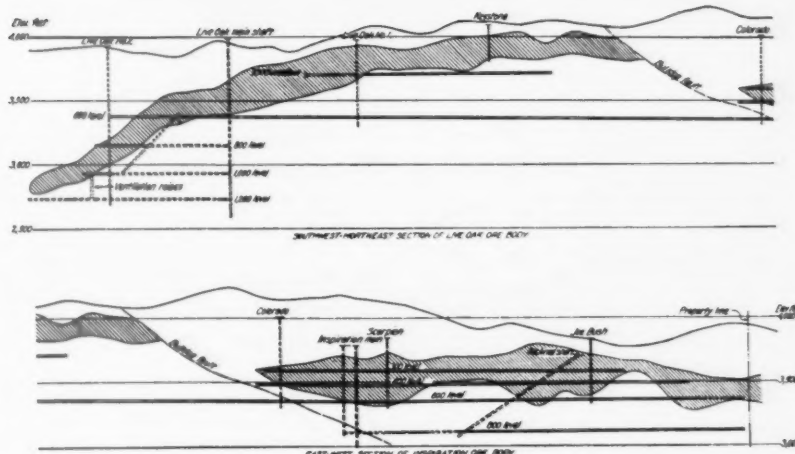


Plate 18

the Inspiration division, hoisting is done through two shafts identical in construction and size, and spaced 104 ft. apart. Each shaft consists of three compartments, each 5 ft. 6 in. by 5 ft. 11 in.

The main Live Oak shaft also consists of two skip compartments which are the same size as those at the Inspiration shaft. The man cage compartment is 6 ft. 9 in. by 12 ft. 4 in. in cross-section. There is also a compartment 2 ft. 9 in. by 12 ft. 4 in. used for ladderway, cage counterweight, pipes and conduits. The shaft is 1,400 ft. deep.

Both the above shafts, including stations and pockets, are concreted throughout.

Haulage drifts are timbered with 8-ft. to 9-ft. posts with caps 7 ft. 6 in. in the clear.

Grizzly and undercutting drifts are driven 4 by 6 ft. to 5 by 7 ft. in section. When timbering is necessary, 7-ft. posts and caps 3 ft. 6 in. in the clear are used.

Raises driven as primary ore passes have varied in cross-section from 3 by 3 ft. to 5 by 7 ft. Timbering consists of 6 by 10-in. cribbing, sometimes

protected by angle iron. Transfer ore passes between haulage drifts are timbered with 10 by 10-in. cribbing angle ironed top and bottom. The cross-section of the raise is 6 ft. by 8 ft. in the clear.

Drilling is done by medium weight drifters and wet pluggers and stopers. Drill steel has been standardized for each type of machine. Seven-eighths in., hollow, hexagon and seven-eighths in. quarter octagon steel is used with pluggers. Seven-eighths in. hollow, quarter octagon is used with stopers, and 1¼ in. hollow, round with drifters.

MINING METHODS

Since the beginning of operations, all ore has been mined by the caving system. Two methods have been used, the "square set" caving method and the "grizzly control" caving method. The essential difference between the two lies in the location of the point of draw control; the first being controlled at a square set placed a short distance above the grizzly level, and the second on the grizzly level. As the Miami method, previously described, is similar in principle to the square set control method, only the grizzly control method will be described here.

Plans and sections of the grizzly control method are shown in Plates 20 and 21.

Transfer raise systems are driven from each side of pony sets placed above haulage drifts at 25-ft. intervals. These raises connect to grizzly drifts spaced 25 ft. apart and 45 to 60 ft. above the haulage level. Transfer raise openings on the grizzly level are 16 ft. apart (center to center) along the grizzly drift and 25 ft. apart at right angles to grizzly drifts.

Grizzly sets are erected over each transfer raise opening on the grizzly level. Finger raises are then driven from opposite sides of the grizzly sets and at right angles to the grizzly drifts. These raises are driven to a vertical height of 18 ft. above the floor of the grizzly level, at which elevation they are 16 ft. center to center in one direction, and alternately 14 and 11 ft. center to center in the other direction.

Undercutting, as shown in Plate 20, is done by connecting the tops of each line (parallel to the grizzly drift) of fingers by means of short inclined raises. The undercut is completed by blasting out the pillars intervening between adjacent lines of these raises.

Cut off stopes along the outer edges of the caving block are driven as required.

Underground Transportation—Electric haulage equipment consists of 8-

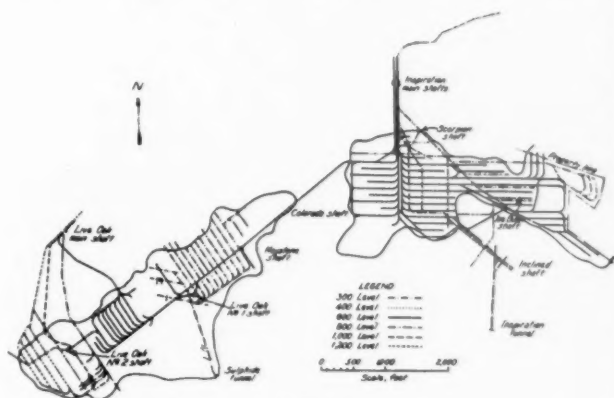


Plate 19

Keystone, the first two being developed by shafts and the last by a tunnel.

In the Inspiration division, three haulage levels have been driven, the 400, 600 and 850 levels. The Live Oak division also has developed four haulage levels, the 600, 800, 1,000 and 1,200. The main haulage level of the Keystone division is the 300, or Sulphide Tunnel level. Ore from this division is hoisted at the Inspiration shaft.

Main hoisting shafts are located at the Inspiration and Live Oak divisions. At

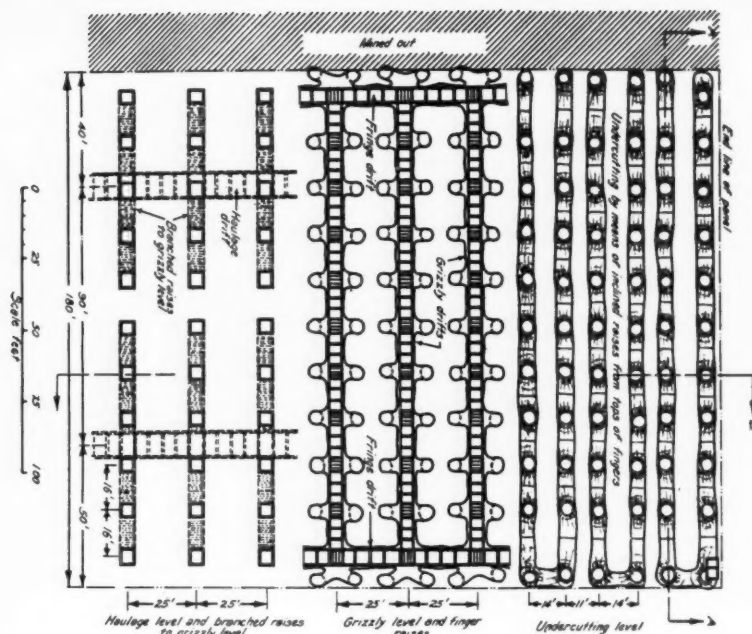


Plate 20

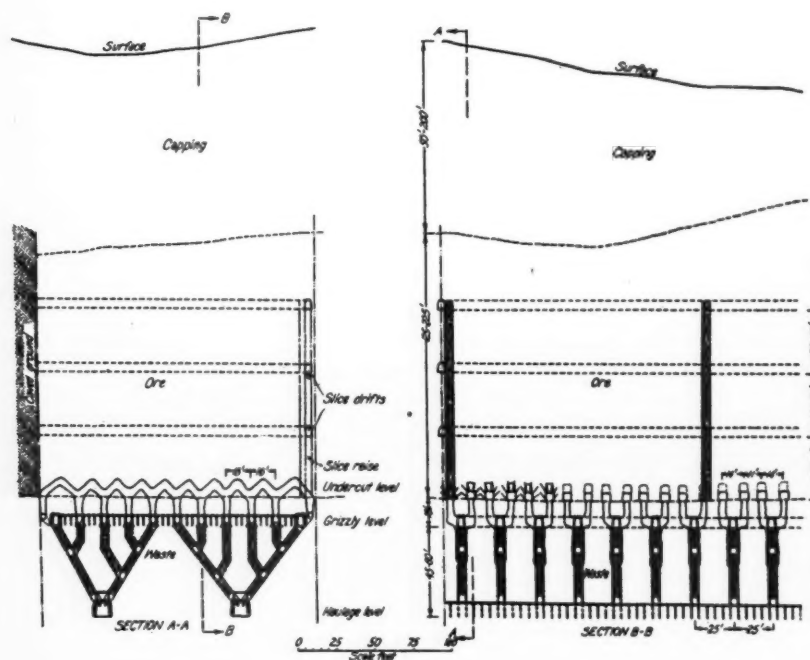


Plate 21

ton trolley locomotives. Ore cars are of 98 to 102 cu. ft. capacity and hold approximately 5 tons. Both box type and side dump cars are in use. Tracks are laid with 40-lb. rail in most cases. Curves are, in general, on 60-ft radius.

Hoisting—At the Inspiration main shafts, ore is hoisted by two double drum electric hoists designed for both manual and automatic operation. The hoisting speed is 750 ft. per minute. Under automatic control, the two hoists combined can hoist 75 skips or 950 tons per

hour. With manual control from the loading floor, their capacity is 105 skips per hour.

The Live Oak is a double drum electric hoist with 12-ft. drums grooved for 1½-in. rope. The hoisting speed was originally 2,200 ft. per minute, but was later reduced to 1,500 ft. per minute.

Skips, which are interchangeable between hoisting compartments in both the Inspiration and Live Oak shafts, will hold between 13 to 14 tons of ore. However, the load is kept at about 12½ tons.

VENTILATION

Primary ventilation is provided by three exhaust fans, one for each of the three mine divisions. These have capacities of 140,000, 110,000 and 70,000 cu. ft. per minute. Fresh air is drawn from the surface through shafts or openings over caved ground.

Secondary ventilation is supplied by high pressure fans placed in the main air courses, and 12-in. tubing.

SAFETY METHODS

Safety work is in charge of a safety inspector who visits all working places and takes the necessary steps to correct any hazardous conditions. He also gives talks to workmen and bosses. Close cooperation exists between the safety inspector and bosses. Foremen and bosses receive a safety bonus for good safety records.

In cooperation with other mining companies of the district, an efficient first aid and mine rescue station is maintained. First aid and mine rescue training is given to employees and contests are held.

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- "Mining Practice and Methods at Inspiration Consolidated Copper Company, Inspiration, Arizona"; by Alfred C. Stoddard; United States Bureau of Mines' Information Circular 6169. September, 1929.

Experience in Metal Mines

With SAFETY Equipment

By E. W. BULLARD*

THIS report is based on 49 returns from a questionnaire sent out to representative metal mines. No company names or trade names were mentioned, in order to avoid any possible bias in the minds of those approached. The questions have been asked by a reliable third party in such a way that those approached thoroughly understood that we wished only their frank expression, and that no ulterior motive existed. We believe this report to be representative of the field.

TYPES OF MINES:

Copper, silver, gold, lead, iron, zinc, nickel.

LOCATION OF MINES:

Mexico, Arizona, Minnesota, New Mexico, Utah, California, Idaho, South Dakota, Nevada, Cuba, Alabama, Pennsylvania, Michigan, Missouri, Kansas, Oklahoma, Canada, New Jersey, Wisconsin, Tennessee.

REPORT SIGNED BY:

General manager	16
General superintendent	20
Assistant manager	1
Safety engineer	3
Welfare director	1
Not specified	6
Assistant superintendent	2
Total.....	49

FIRST AID SUPPLIES:

Do your men carry individual first aid packets?

No	36
Yes	8
Shift bosses only	2
No answer	1
Foreman	1
Partial	1
Total.....	49

First aid supplies underground?

Yes	39
No	9
Some	1
Total.....	49

HEAD PROTECTION:

Safety hats?

Yes	36
No	10
Some	2
No answer	1
Total.....	49

Are safety hats of value?

Yes	39
No	2
*No answer	7
Men do not like	1
Total.....	49

How many accidents prevented?

25 per year	2
do not know	6
per year	20
1 per month	5
several	5
5 serious, many minor	no record
3 per year	6
6 in shaft sinking	3
a great many	6
at least	2
none	several
75 percent	4
4 in 3 months	great number
1/2 dozen	99 percent

FOOT PROTECTION:

Many toe injuries?

Yes	13
No	26
80 percent wear safety shoes	1
A few	1
No answer	2
Not many	4
Some	2
Total.....	49

Are safety shoes practical?

Yes	19
Being introduced	1
Have not tried them	6
Yes, in dry mines	1
Some are	2
No answer	8
No	6
Still in experimental stage	3
Yes, in rubber boots	1
Not necessary	1
Doubt it	1
Total.....	49

GAS MASKS AND BREATHING APPARATUS:

Do you maintain a rescue station?

Yes	32
No	17
Total.....	49

Is your rescue station of value?

Yes	24
No occasion to use it to date	6
*No answer	15
No	3
Not needed	1
Total.....	49

RESUSCITATION EQUIPMENT:

Do you have resuscitation equipment on the property?

Yes	26
No answer	2
One ordered	1
No	20
Total.....	49

Has it proved of value?

Yes	19
Not been used	4
*No answer	23
No	2
Think more of artificial respiration	1
Total.....	49

Are your men trained in first aid?

Yes	33
50 percent	1
Some	3
30 percent	1
A few	2
No	3
Not fully	1
Being trained	1
95 percent	1
10 percent	1
About 1 in 5	1
No answer	1
Total.....	49

EYE PROTECTION:

Goggles for workers underground?

Yes	33
Very limited	1
Few places	2
No	10
Some cases	2
Samples only	1
Total.....	49

* President, E. D. Bullard Company.

* From mines that have never used safety hats.

* From mines that have never used rescue apparatus.
* Chiefly from those who have no resuscitation equipment.

Kind of goggle?

Wire screen	34
Glass lens	12
No answer	3
Total	49

Has use of goggles decreased accidents?

Yes	28
Expect them to	1
Probably	2
No answer	15
*Decidedly	2
Very much	1
Total	49

SAFETY ORGANIZATION:

Have you a safety organization?

Yes	44
No	5
Total	49

Is it of real value?

Yes	43
No answer	5
Appears to be	1
Total	49

BREATHING PROTECTION.—Dust hazard in metal mines is a relatively new problem and for this reason is not treated statistically. It is becoming to be well recognized that continued breathing of dust gives rise to occupational disease. Prominent among such dusts is silica dust, giving rise to silicosis.

Effective methods of prevention include segregation of dust products operations, dust control, ventilation, protective devices, and proper medical supervision. Under protective devices, respirators are becoming more and more to be accepted as one means of overcoming the dust hazard.

WHAT DO YOU CONSIDER THE MOST VALUABLE PART OF YOUR SAFETY WORK?

Training men in knowledge of safety rules, and members of safety committee checking on safe practices. Impressing on bosses their responsibility in seeing that all work is performed in safe manner, by means of lectures, posters, pictures, photos, and picture slides. Reporting to boss of any unsafe condition.

Gaining and maintaining cooperation of bosses and workmen toward greater effort in elimination of hazards.

Bosses keeping close watch on working places and superintendent keeping record of all accidents.

Safety education from top to bottom of organization and developing correct mental attitude toward safety.

Periodical safety inspection—also bulletins, pictures, meetings, and discussions.

Strict adherence to all safety men—close and very strict supervision.

Enforcement of safety rules.

Special attention to safety by operating foreman and bosses.

Selling the safety idea to the worker.

* No serious eye injuries since compulsory use of goggles.

Safety supervision by safety bosses.
Discipline for violation of safety rules.

Personal contact with men.

Education of employes—real solution.

Safety instruction to men by shift bosses.

Safety bonus to shift bosses. Constant attention to safety by superintendent, foreman, assistant foreman.

Workman's committee making periodical inspection.

Educational side.

Employ of assistant shifters as safety men.

Education of employes to work safely.

First aid and taking prompt care of injured.

Securing cooperation on and maintaining a friendly attitude of the men toward safety work.

Inspection of stope, roof, and ladder ways by experts of crew, daily.

Individual talks to workmen, competition to gain by safety record—not otherwise due to parties.



Very close supervision and constant cautioning by men in charge.

Frequent rigid inspections of mine—lunch hour safety talks.

Officials to cooperate in every case.

Education to the individual.

Educational programs.

Organization is distinctive.

Contests with money, rewards for good records.

Constantly reminding men to think and act safely.

Individual using of safety equipment.

Teaching workmen precautions.

Education of men most valuable—especially foremen.

Cooperation of every man on ground.

Being careful.

Safety lectures and literature.

Training education and morale of the group.

Education and inspection.

Working places clean and free from litters.

Monthly foremen's meeting when accidents are discussed.

Personal contact with worker through foreman and safety engineer.

Careful inspection and cooperation of men.

Instilling safety idea into every man.

Education and cooperation of employees.

Instruction of employes in safety methods, and use of first aid equipment.

Educational work.

Mine openings kept clean and well ventilated.

Safety laws put into effect by employees—compulsory use of hard-boiled hats, goggles, and safety equipment.

WHAT TYPE OF SAFETY EQUIPMENT, IN YOUR ESTIMATION, IS MOST NEEDED BY THE MINING INDUSTRY?

Goggles, safety hats, safety shoes, safety belts.

Operating equipment so designed and installed as to reduce hazards to a minimum.

Fire signals to underground men; proper exit in case of fire; guards on mechanical devices; sirens; etc.

Safety hats.

All mechanical equipment, all safety appliances added to all machinery.

Safe workers. Human element constitutes possibly 90 percent of accident prevention vs. possibly 10 percent for mechanical means.

Protective clothing valuable, goggles essential.

Common horse sense and education.

First aid boxes, stretchers, hard-boiled hats, dry blankets, and goggles.

Oxygen breathing apparatus, hard-boiled hats, wire-screened goggles, and safety shoes.

A real comfortable safety shoe (comfortable toe) is greatly needed for underground work and safety work.

A good design of toe protector.

Goggles, hats, shoes.

Protection against injury of moving parts of machinery, protection for eyes. Preventative and educational line, first aid supplies.

Better knowledge of ventilation, methods of handling hurt men.

Goggles, safety hats, and safety shoes.

Individual safety equipment: hats, goggles, and shoes.

Head and foot protection.

"Too hard for me."

Goggles and helmets.

Gas masks, breathing apparatus, iodine swabs, mercurochrome, bandages.

Teaching the men that, as a result of injury, they personally suffer the greatest loss.

Dressing stations.

Hard-boiled hats and goggles.

Cooperation and education.

Safety clutches for cages, automatic stops for hoists, etc.

Coordinated competitive competitions.

Equipment protecting eyes, fingers, toes.

(Concluded on page 33)

An Active Interest in Goggles

Reduces Cost-per-ton*

THERE'S nothing spectacular about eye accidents: no "front page news" quality—such as there is in cave-ins, explosions, and other catastrophes.

A chip, a piece of coal, a speck of dust, finds its mark in an unprotected eye—the victim's hand clasps over the injured spot—his face distorts—a cry escapes him—that's all.

But eye accidents are so frequent and so expensive that if they were front page news, every mine would put an end to them. Except for the construction field, the coal mining industry has the highest eye accident rate per thousand workers.

In Pennsylvania alone, during the 10-year period between 1924 and 1933, 10,781 miners paid for eye accidents with total or partial blindness. This total, reported to the Pennsylvania Department of Labor and Industry, includes only those accidents covered by the compensation law. How many other less serious—but still expensive eye accidents occurred—no one knows.

Most eye accidents occur when a miner is digging, breaking rock, driving spikes, hitching a rib, setting jack pipes, changing machine bits, operating drills, driving cap pieces (there are extra hazards from the exhaust of air-driven drills and other air-driven machines) blowing out holes, picking refuse, testing the roof. Others are caused by particles of coal snapping from the face or from pillars. There is hardly any routine job entirely free from eye hazard.

Eye injuries, causing a major proportion of all lost time accidents, cost one dollar out of every four which mine operators pay out in compensation . . . yet, other factors that enter into the cost of accidents and cannot be readily calculated in money values, are conservatively estimated to be four times the compensation cost.

Among the "other factors" that add so to the cost of mining coal are found medical and hospital expenses, loss of time and production, administrative expenses, the bad effect on the morale of fellow workers and other miscellaneous expenses which may vary widely with each particular accident. At the time of the accident, damage to equipment frequently occurs.

As pointed out by no less an authority than the U. S. Bureau of Mines—a reduction of 1 cent per ton in compensation cost would actually be a reduction of 5 cents in cost-per-ton.

Reckoning the cost of eye accidents in terms of lost time, the U. S. Bureau of Mines states that "eye-loss accounts for the greatest number of days lost . . . an average of 329,560 days lost per year from this cause in Pennsylvania mines." This time loss does not take into account that due to eye injuries where there is no loss of eyes; it amounts to an average of 1,076 man-years per year, which would be equivalent to the total employment of three average mines.

Here are some other pertinent facts about eyes in relation to coal mining: *Eyes cost the industry in direct cash outlay over twice as much as foot injuries; as much as hand, finger, and leg injuries together.*

Eye injuries are the most expensive of mine accidents—yet they are among the easiest and least expensive to prevent. Even the slightest eye injury costs more than the goggles that would have prevented the accident. In some districts, the insurance credits for eye protection more than pay the entire cost of supplying goggles.

Those are a few of the facts and the companies that know them best are lowering the cost of mining coal by taking an active interest in goggles. One mine, whose underground workers now wear goggles continuously, reduced eye injuries 95 percent in two years. Another mine reduced lost time eye cases 100 percent over a five-year period through the proper use of goggles. A large Eastern operator reduced his cost of producing coal \$30,000 a year by following a safety program in which goggles play a leading part. Still another mine, with a carefully planned safety and goggle program had a compensation cost of less than 1 cent per ton.

Now contrast the foregoing examples with the records made by companies making little real effort to enforce eye protection or any other safety program. These companies show compensation costs of around 7 cents per ton. To arrive at a rough approximation of the cost of eye accidents in their mines—and the earnings of an effective eye safety program—operators have employed two quick rule-of-thumb methods:

(1) If a mine has no goggle program in force and the working conditions are more or less typical of the section of the industry, its direct compensation and hidden losses will run about 4 cents per

ton in the bituminous field; about 9 cents per ton in the anthracite field.

(2) If accident records are complete, an accurate figure for direct loss can be obtained directly. To find the total loss (according to the U. S. Bureau of Mines' estimate) multiply this direct loss figure by five.

It isn't enough to recognize the value of adequate eye protection. Most companies do that. The properties with good eye safety records and low costs per ton make a real and continuous effort to get their miners to wear goggles on every job where there is the slightest possibility of an eye accident.

The way to prevent eye accidents is to have miners wear goggles all the time. Many eye injuries happen to men whose goggles were "in their jumpers" many feet away when the accident occurred—or any other place but over their eyes.

Taking an active interest in goggles implies not only seeing that men have goggles but also seeing that the goggles are the right type for the work and that they fit well and are comfortable. When this is done you can be sure that miners will willingly wear their goggles—protecting their own eyes and lowering your cost-per-ton.

Safety in Metal Mines

(Continued from page 32)

Hard-boiled hats, hard-toe shoes, rubbers, goggles, leather gloves, safety belts.

Getting what is needed, depending on mine.

Safety hats, gloves, goggles.

Better type miner's lamp.

Goggles, helmets, and ladders; protections for eyes.

Horse sense.

Hats, boots, goggles.

Preventative equipment, minimizing accidents.

Resuscitation equipment, hard-boiled hats, and shoes.

A Correction

OUR July issue carried the name of the Mancha Storage Battery Locomotive Company, as "Mancha Storage Battery Company." We regret the error.

* American Optical Company.

PERSONALS

Both **H. DeWitt Smith** and **Fred Searls, Jr.**, of the Newmont Mining Corporation, were recently in Mexico, visiting the properties of the Cusi Mexicana Mining Company.

Frank E. Taplin, president of the North American Coal Corporation, has been elected chairman of the board of this company which he organized.

J. C. Kinnear, general manager of the McGill, Nevada properties of the Nevada Consolidated Copper Corp., is on an extended boat trip to Central and South American waters.

Hugh M. Roberts, mining geologist of Duluth, Minnesota, has returned from extended professional trips, which included Colorado and Mexico.

William B. Daly, Manager of Mines, Anaconda Copper Mining Company has been confined to his home because of a broken arm.

G. H. Jones, president, Hillside Flour-spar Company, chairman of the Illinois section of the program committee for the Western Division meeting, The American Mining Congress, called a meeting of his group for July 24, when the preliminary program was discussed.

Myron C. Taylor, chairman of the Board United States Steel Corporation returned to the United States late in July after a European trip.

S. A. Lewisohn, vice president, Miami Copper Company, attended the conference of the International Labor Organization in Geneva, as an American delegate.

P. G. Beckett, vice president and general manager, Phelps Dodge Corporation, announces the appointment of **I. H. Barkdoll**, as general superintendent, and **H. C. Henrie**, as assistant general superintendent.

W. J. Harahan was recently elected president of the Chesapeake and Ohio Railway Company, one of the largest coal carrying roads in the country.

James L. O'Neill, who has been acting NRA administrator, has returned to his duties with the Guaranty Trust Company.

P. C. Thomas and his daughter, Miss Burnette, spent several weeks at the Shoreham Hotel, Washington, D. C., during July.

R. S. Palmer, secretary, Colorado Metal Mining fund, has accepted the appointment as national chairman of the "MINERAL STATE EXHIBIT" to be held in conjunction with the Chicago convention of the Western Division, The American Mining Congress.

State chairmen serving with **William B. Daly**, in developing the program for

the Western Division meeting, The American Mining Congress, are the following: **P. G. Beckett**, Phelps Dodge Corporation; **Guy N. Bjorge**, Homestake Mining Company; **W. N. Smith**, Vinegar Hill Mining Company; **Carl Zapffe**, manager of Iron Ore Properties, Northern Pacific Ry. Co.

E. E. Ellis, vice president, United States Steel Corporation, in charge of raw materials recently made an inspection trip of the company's mines. **Leroy Salsich**, president, and **A. Y. Peterson**, vice president and general manager, of the Oliver Iron Mining Company accompanied him on the trip.

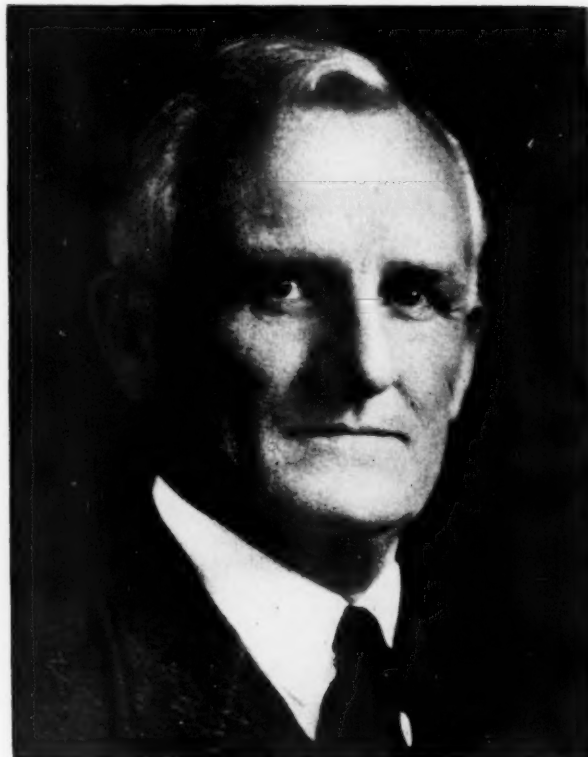
D. D. Dodge has resigned as vice president, W. J. Rainey Company, effective August 1. While his future plans have not yet been announced, it is understood that he will continue to be identified with the bituminous coal mining industry. Mr. Dodge has been associated with the W. J. Rainey Company since 1926, where he has established an enviable record as a progressive operating man.

R. C. Allen, vice president, Oglebay, Norton Company, Cleveland, attended the sectional meeting of the A. I. M. M. E., in the Lake Superior District.

H. A. Beuhler, president, and **A. B. Parsons**, secretary, The American Institute of Mining and Metallurgical Engineers, recently visited the Lake Superior Iron Ore District, stopping for special entertainment at Crosby, Hibbing, and Duluth, Minn.

Cecil Smith, formerly of the Illinois Coal Corporation, now affiliated with the Minneapolis power industry, was a Washington visitor late in July.

Guy N. Bjorge, who, with Mrs. Bjorge and Miss Rosemary, have been spend-



DONALD B. GILLIES

ing their vacation in the Eastern states have returned to their home at Lead, S. Dak., where Mr. Bjorge is associated with the Homestake Mining Company.

Donald B. Gillies, Corrigan, McKinney Steel Company of Cleveland, Ohio, recently had the large and modern cargo ship of the Pioneer Steamship Company, named for him.

Howard I. Young, president of the American Zinc Lead and Smelting Company attended a special meeting of the Illinois section of the program committee for the Western Division of The American Mining Congress.

Captain J. P. Hodgson has resigned as manager of the Copper Queen Branch of the Phelps Dodge Corporation. Ill health forced his resignation, but he will continue with the corporation in a consulting capacity.

Among the callers at the offices of the American Mining Congress this month were:

R. T. Fleming, Texas Gulf Sulphur Company; **Herbert Jackson**, Pickands, Mather and Company; **Henry T. O'Blenness**, Berwind-White Coal Mining Company; and **F. G. Hamrick**, American Smelting and Refining Company.

MINING EVENTS

Coal

THE bituminous section of the coal industry continued to spend considerable time in Washington both opposing and advocating the Guffey Coal Bill, and negotiating a wage scale with the United Mine Workers of America. The situation is unchanged, each side claiming the winning hand in both these arguments.

After considerable discussion the wage agreement with the mine workers has been extended to September 16. This further extension was brought about largely by the President of the United States, who through a letter transmitted by Secretary of Labor Perkins, said:

"I am appreciative of the continuing efforts of the joint conference between the bituminous operators and the United Mine Workers now in session, to reach some satisfactory agreement and solution of their problems.

"It would be unfortunate if these efforts towards a new contract and agreement were given up, leaving the country to the possible suspension of operation in the bituminous mining industry on August 1.

"It is highly desirable that this great industry be stabilized, for the advantage to the workers, the operators and the public in general. You are familiar with the progress that is being made in the legislative effort to assist in the stabilization of this industry.

"Your existing contract expired on April 1 of this year and has been renewed under temporary extension at the request of the government. The third extension expires on August 1. Not all of the future problems of the industry have been completely resolved and there is still uncertainty, yet the effect of a suspension of bituminous coal mining is so unfortunate for the whole country, and the prospects of constructive legislation are so substantial that I am writing to ask you to again extend the present contract for a further period up until September 16.

"Certainly by that time the situation will be clarified and you will be in a better position to renew your joint negotiations."

To which the committee replied:

"Your communication of July 26, transmitted by Secretary of Labor Frances Perkins to the Joint Appalachian Conference of Operators and Miners, in which you request an extension of the present agreement until September 16 and submit the reasons assigned for such extension, has been carefully considered by the subcommittee of the aforesaid Joint Conference.

"The committee, by unanimous vote, accedes to your request, and the officers were instructed to so inform your Excellency. A contract covering the extension period will be signed by the officers as of this date. It is the hope of the contracting parties that in the mean-

time a satisfactory agreement can be consummated."

The accepted contract reads:

"The existing Appalachian Agreement and supplementary Appalachian Region District Agreements of April 1, 1934, and all wage agreements between parties participating in the Joint Conference of February 18, 1935, and subsequent extension agreements continuing said agreements, shall continue in full force and effect in all their provisions until September 16, 1935, in compliance with the request of the President of the United States in his letter of July 26, 1935, addressed to the Appalachian Joint Conference of Miners and Operators."

UNDER the new set-up of NRA and under the direction of Leon C. Marshall, a study will commence at once of all data gathered by the Administration since its inception with respect to the coal industry. Data available before the inception of NRA will also be compiled and a complete study of the operation of the code made for the benefit of the industry. The study will try to show the economic results or achievements under the code and efforts made to make an appraisal of the whole coal situation, all of which will be in the nature of a factual and analytical study. There will be no attempt to prove anything except as the facts may warrant after they have been collected and compiled.

THE weekly coal report of the U. S. Bureau of Mines gives the following figures relating to bituminous coal:

Week ended	Production		Percentage of decrease	Loadings	
	1935	1934		1935	1934
July 13	4,613,000*	5,813,000	20.6	78,980*	102,924
July 20	5,515,000†	5,753,000	4.1	95,245†	102,188

Year's production to July 20, 1935—202,112,000† tons; corresponding period 1934—198,886,000 tons; an increase of 3,226,000 tons, or 1.6 percent.

* Revised. † Subject to revision.

WALTER GORDON MERRITT, general counsel for the Anthracite Institute, in a recent statement outlined anthracite's approval of plans of its administrator, saying:

"Now that the Supreme Court of the United States has pointed out the constitutional limitations to the regulation of business by the Federal Government, the problem of self-government in industry has become a major problem today. This problem of self-government, moreover, must be reconciled with the inhibitions of the anti-trust laws which still, in a

large degree, have public and political support. While there is little doubt in the minds of lawyers familiar with these problems that the tendency of the Supreme Court to permit wholesome collective action in the interest of industrial self-government, which was manifest even before the days of NIRA, will be continued and even accelerated by the experience which industry has had under NIRA, it nevertheless remains true that the scope of useful group action in industry and the principles for industrial self-government, by reason thereof, must be reconciled with the anti-trust laws. In general, industry cannot fix prices, allocate territory or customers, or curtail production as a means of price stabilization, because, fundamentally, the public is entitled to such protection as may flow from the supposed benefits of fair competition. On the other hand, it has become increasingly clear that unfair methods of competition, unfair merchandising practices, unfair discrimination, and failure on the part of competitors honestly to pursue a course which they profess to be pursuing, all constitute unfair practices which industry, in its efforts at self-government, may unite to combat and, if possible, eliminate. Uncontrolled competition may still be the mandate of the law, but that still leaves industry a broad field of permissive action whereby it may refine that competition and purge it of those abuses which, from their very nature, are inconsistent with fair competition and obstructive of those benefits which competition is supposed to bring to dealer and consumer.

"Having these general principles in

mind, the Anthracite Industry has been one of the first to recognize the changed conditions which have been brought about by the stimulation of group action in the past few years and the recent downfall of the efforts of the Government to direct and control such group action. It has accordingly embarked on a program to eliminate unfair practices and thus raise the level of competitive practices above those which prevail in so many industries. The best assurance and hope of the success of this movement is the fact that the industry has prevailed upon one

of its most outstanding leaders, Mr. Charles F. Huber, to assume the office of administrator for the industry and take charge of the direction of the administration of the new program. Because of the importance of this effort and the far-reaching possibilities of good results which it is expected will flow from it, Mr. Huber has retired from his position as chairman of the board of directors of the Glen Alden Coal Company to give his entire time to this work.

"The program requires that every signatory producer shall file with the Anthracite Institute the prices, terms of sale, and sales policies which have been applied by the producer in connection with all sales. In order to avoid the burdensome necessity of separately filing the details of each transaction, each producer at the outset files with the institute the latest prices, terms of sale, and sales policies at which he sold each size of coal. These prices, terms and sales policies remain constant as the factors controlling all transactions except, when the producer shall file with the institute promptly full information as to changed prices, terms or sales policies which he has applied in connection with any sale of anthracite. When any changes are so filed, they become the sole prices, terms, and sales policies of the producer applicable to all of his customers similarly situated, until such time as he informs the administrator of sales or offers to sell at different prices, or on different terms.

"All such information filed with the administrator is subject to inspection by producers and purchasers and is promptly transmitted to all signatory producers and their customers who pay their pro rata share for the cost of such service.

"Thus a policy of open and frank dealings between producers and dealers becomes the order of the day in the Anthracite Industry, thereby making it possible in the future for producers and dealers to possess full information as to the essentials of merchandising practices prevailing and to shape their conduct in the light of such information rather than in the light of speculation and suspicion.

"Through the operation of this open price plan every dealer will have greater assurance than ever before that he is receiving from the producer whom he patronizes as advantageous terms as any other dealer similarly situated. The days of secret haggling, under-cover concessions, and special bargains will yield, it is hoped, to a new era of open, equal, and impartial treatment. Such a standard is consistent with the ideals of American business. There was a time in the history of this country when customers entering a retail store haggled over the price which they would pay for standard articles. Such chaotic condition is still characteristic among retailers in some European countries, but in the United States, at least, this practice of private haggling has largely passed out of the field of retail distribution.

"Another factor which is the bane of many industries and which has been a

Size	Moisture as rec'd. *	Vol'tl. matter	Dry coal			As rec'd. *	B.t.u. Dry coal	Moisture and ash free	Soft'ng temp. of ash, °F. †
			Fixed carbon	Ash	Sul- phur				
Egg	4.2	4.4	86.4	9.2	.7	13,100	13,670	15,060	2,890
Stove	4.3	4.4	86.3	9.3	.7	13,040	13,630	15,030	2,890
Chestnut	4.8	4.3	86.0	9.7	.7	12,900	13,550	15,010	2,890
Pea	6.2	4.3	84.4	11.3	.7	12,470	13,290	14,980	2,890
Buckwheat ..	6.0	4.6	83.7	11.7	.7	12,430	13,220	14,970	2,880
Rice	5.7	4.5	83.1	12.4	.7	12,330	13,080	14,930	2,900
Barley	7.2	4.4	82.1	13.6	.7	11,980	12,890	14,920	2,880

* These samples were taken as the coal came from the breakers immediately after washing. Therefore, "Moisture as received" includes, in addition to inherent moisture of about 2 percent, the moisture due to water clinging to the coal from the washing process. In a short time after loading much of the free moisture drains off so that coal delivered to the consumer would have a heating value, according to size, between 175 and 350 B.t.u. per pound higher than shown in the column "B.t.u. as received."

† Softening temperature of ash given are averages of determinations which include numerous "plus maximum readings" which range between 2,490 and 2,970 degrees Fahrenheit. The actual average softening temperature is somewhat higher than these given in the table.

destructive tool in the hands of unscrupulous buyers, has been the circulation of false rumors as to prices and terms which are in fact controlling the sale and purchase of a product. Credence to such rumors, when they have no foundation in fact, has led many sellers to depart from sound merchandising practices and to shift to uneconomic practices, solely because of the suspicion created that a competitor is pursuing some unwise and unfair method of competition, when in fact such is not the case. Anybody familiar with the trends of large industries and the manner in which many of them have been catapulted into destructive practices must realize that suspicion and speculation, which are the results of lack of full information, and secret merchandising practices have been an important and even a crucial factor in bringing about unsound economic conditions. It is hoped and believed that the program which the Anthracite Industry has now adopted will end the opportunity for the unscrupulous to take unfair advantage of such a situation and will protect the credulous from becoming the prey of suspicion and speculation.

"The program further provides that certain unfair methods of competition, such as misrepresenting the size, grade, or origin of anthracite, failure to comply with standard sizing, and the resort to various specified trade practices, which have become generally recognized as unfair, shall not take place. These practices follow along lines which are familiar to the era of codes of ethics fathered by the Federal Trade Commission, and to the various codes of fair competition which were approved by NRA. Such practices do not prevail in the Anthracite Industry any more than they prevail in American industry as a whole, but it is the purpose of this program that the Anthracite Industry shall be among the first to afford some reasonable assurance that they shall not continue.

"There is nothing in the program of the Anthracite Industry which interferes with any producer fixing his own prices, terms and sales policies. Such matters are left to the individual discretion and

judgment of each producer. But in this program there is assurance that unfair practices will end and that when a producer lowers his price or raises his price, all producers and all customers will have full knowledge of that situation so that they may be governed accordingly. It will no longer be possible to make secret arrangements giving one dealer an advantage over other dealers similarly situated, without those advantages being extended to all dealers and without competing producers being placed immediately in a position to act in the interest of self-protection."

AT THE request of the Anthracite Institute, the United States Bureau of Mines during February, March, and April, 1935, made a field survey of commercial anthracite shipped from collieries scattered throughout the anthracite regions.

In all, 268 samples were taken at 41 breakers from Carbondale at the northern end of the field, to Pottsville at the south. These collieries ship approximately 50 percent of the industry's total production. The geographical distribution of the breakers sampled was as nearly as practicable in proportion to the tonnage of the companies from each region cooperating in the plan.

The weighted average analyses, by sizes, of the samples taken in this survey are shown in the above table.

The Bureau of Mines has had from its inception the ideal of supplying to the public accurate information concerning the quality of American coals. It has made over 200,000 analyses of bituminous coals for the use of the public. It is rare, however, that figures for any district, or any particular kind of coal, can be had of a weighted average of quality comparable with these figures for anthracite as prepared at breakers in 1935. These figures are more like the annual gasoline quality survey which has been made by the bureau for many years.

Analyses of any prepared product vary through a normal range for each fac-

tory and for coal they vary from mine to mine.

These figures for anthracite give a very fair picture of the quality of the product available to the public in 1935 from breakers of the anthracite industry. These figures should be used in making general comparisons with other fuels and with other anthracite products.

THE total production of anthracite (which includes colliery fuel) for the week ending July 6, as estimated by the United States Bureau of Mines, Department of the Interior, Washington, D. C., amounted to 712,000 net tons. This is a decrease, as compared with production of the preceding week, of 752,000 net tons, or 51.4 percent. Production during the corresponding week in 1934 amounted to 657,000 tons.

Preliminary figures show that the total production of anthracite (including colliery fuel) for the month of June, 1935, amounted to 5,642,000 net tons, as compared with 4,919,000 tons during the preceding month of May, and 4,184,000 tons during the month of June, 1934.

Shipments of anthracite for the month of June, 1935, as reported to the Anthracite Institute, amounted to 4,878,738 net tons. This is an increase, as compared with shipments during the preceding month of May, of 531,875 net tons, or 12.24 percent, and when compared with June, 1934, shows an increase of 1,383,515 net tons, or 39.58 percent.

THE annual meeting of the Big Sandy Elkhorn Coal Operators Association was held recently in the Association offices, 421 Kitchen Building, Ashland, Ky., with 92 percent of the membership tonnage represented. Members of the board of directors during the past year were reelected, with the addition of two members, for the coming year, as follows: G. L. Cox, Elkhorn Piney Coal Mining Co., Huntington, W. Va.; O. P. Chatfield, Paragon Elkhorn Collieries Co., Dunleary, Ky.; T. W. English, Consolidation Coal Co., Jenkins, Ky.; Thomas S. Haymond, Elk Horn Coal Corp., Fleming, Ky.; S. B. Hosmer, Elkhorn Collieries Corp., Cincinnati, Ohio; C. D. Jacobs, Utilities Elkhorn Coal Co., Pikeville, Ky.; E. R. Price, Inland Steel Company, Wheelwright, Ky.; W. F. Pioch, North East Coal Co., Huntington, W. Va.; B. F. Reed, Turner Elkhorn Mining Co., Drift, Ky.; A. D. W. Smith, South-East Coal Co., Cincinnati, Ohio; E. A. Starling, United Elkhorn Coal Co., Pikeville, Ky.; C. W. Watson, Elk Horn Coal Corp., Cincinnati, Ohio; A. J. Alexander, Pike-Floyd Coal Co., Betsy Layne, Ky.; W. F. Mandt, Stephens Elkhorn Fuel Corp., Alphoretta, Ky.

Gold and Silver

PRESIDENT ROOSEVELT, in answering the Senate silver group's demands for silver action, states that Secretary of the Treasury Morgenthau has and will discharge the duty placed upon him by the Silver Purchase Act "in the manner most advantageous to the public interest."

The President, in his letter to the Senate group, dated July 25, states that "I am glad to have the benefit of your observation and suggestions on this subject. As evidence of the broad objectives I need only to refer to my message on silver to the Congress on May 22, 1934, which is but one of numerous statements I have made on the desirability of a wider monetary use of silver."

Mr. Roosevelt stated that he was glad to have his silver message supplemented by statements made on his behalf to the effect that: If the Silver Purchase Act were passed it would be carried out vigorously and in good faith. The administration of this Act has been, and of course will be, characterized by this spirit and purpose.

"When we come to such particulars as the amount and price of day to day silver and the issuance of silver certificates in excess of the cost of the silver, their determination is a duty which the Congress by the provisions of the Silver Purchase Act has laid upon the Secretary of the Treasury. I know from my frequent conferences with him on the administration of this Act, surcharged with such great possibilities for our national welfare and the advantage of the world that that duty has been and will be discharged in the manner most advantageous to the public interest as the Act itself enjoins and in pursuit of our common objective of a wider monetary use of silver."

JOHAN MARTIN, retiring president of the Transvaal Chamber of Mines, in a recent statement, had the following to say about the future of the gold mining industry:

"A question of paramount interest is the future of gold in the monetary affairs of the world. About a year ago I suggested that the course of events since the United Kingdom was forced off the gold standard had not been such as to diminish faith in the future importance of gold. The countries that adhered to their old gold parities in spite of the strain of world depression adhere to them still. Countries which had left the gold standard have continued to show their confidence in gold by continuing to accumulate gold reserves. If the central banks of the world be taken as a whole, we find that their gold reserves increased from a total of £2,461,000,000 at the end of 1933 to £3,652,000,000 at the end of 1934.

"I suggested also that, even if all countries left the gold standard, in the sense of maintaining a fixed price at which their monetary authorities would buy or sell gold in unlimited amounts, gold would still be used to settle international payments and to hold balances. The past year has seen a continuance of the transfer of gold from one country to another, as a means of transferring funds, on a scale that had no parallel when the world was on the gold standard—a confirmation, so far as the experience of one more year has any relevance, of what was predicted. And there is evidence that the practice of holding

balances against pending or possible international payments has grown.

"It is customary to speak of all gold holdings outside the holdings of central banks as 'hoarded.' If by this phraseology it is intended to suggest that all these holdings are due to nervousness or the desire for a speculative profit based on a possible rise in the value of gold, I would suggest that it is out of date and misleading. These holdings are largely in the hands of great trading and manufacturing concerns which have widespread international connections and corresponding international obligations. They would doubtless prefer to hold their balances in the form of bank deposits or interest-earning securities until the time came when the balances had to be used for the purpose for which they were accumulated; but they find it expedient to forego such small earnings as these, in order to hold the balances in a form in which they are readily available without loss of value in any part of the world, whatever may happen to particular national currencies. Since their business requires them to make international payments, and the common international gold standards has been lost, they are faced with the alternative of speculating in the exchanges or holding their own gold reserve.

"Those of us who have the executive responsibility of conducting the affairs of the gold mines desire to secure for this great industry the greatest possible measure of stability and length of life. We welcome the increase in the money value of our product with the possibilities of extending the life of the mines, as well as maintaining or increasing profits that it brings. But we should regret any sudden fluctuations or sensational rise in the value of gold; whatever temporary increase in profits such change might bring would be dearly bought at the price of instability and uncertainty for the future."

Iron and Steel

THE iron ore mined in the United States in 1934 amounted to 24,587,616 gross tons, an increase of 40 percent compared with 1933 but 35 percent below the average for the preceding five years. Iron Ore was produced at 141 mines in 15 states in 1934, compared with 132 mines in 15 states also in 1933.

The shipments of iron ore in 1934 amounted to 25,792,606 gross tons valued at \$66,483,846, an increase of 4.7 percent in quantity and of 4.2 percent in total value compared with 1933. Compared with the 5-year average for 1929 to 1933, the 1934 shipments showed a decrease of 32 percent. The average value per ton of iron ore at the mines in 1934 was \$2.58 against \$2.59 in 1933.

The stocks of iron ore at mines at the end of 1934 amounted to 10,340,690 gross tons, a decrease of 6 percent from 1933. The stocks at the end of 1934 were about 1,474,000 tons below the average for the preceding five years.

IRON ORE MINED IN THE UNITED STATES, BY MINING DISTRICTS AND VARIETIES, 1933-34, IN GROSS TONS
(Exclusive of ore containing 5 percent or more manganese)

District	Hematite	Brown ore	Magnetite	Carbonate	Total
1933					
Lake Superior*	14,611,032	.....	.....	...	14,611,032
Birmingham	1,925,090	118,567	.....	...	2,043,657
Chattanooga	386	20,964	.....	...	21,350
Adirondack	.....	.....	58,718	...	58,718
Northern New Jersey and southeastern New York	.....	.....	73,144	...	73,144
Other districts	384,164	95,766	264,858	499	745,287
	16,920,672	235,297	396,720	499	17,553,188
1934					
Lake Superior*	21,030,756	.....	.....	...	21,030,756
Birmingham	2,049,915	175,895	.....	...	2,225,810
Chattanooga	16,305	17,873	.....	...	34,178
Adirondack	.....	.....	†244,962	...	†244,962
Northern New Jersey and southeastern New York	.....	.....	138,685	...	138,685
Other districts	†294,017	92,305	526,263	640	†913,225
	†23,390,993	286,073	†909,910	640	24,587,616

* Includes only those mines in Wisconsin which are in the true Lake Superior district.

† Some hematite from "Other districts" included with magnetite from Adirondack district.

IRON ORE SHIPPED FROM MINES IN THE UNITED STATES, 1933-34, BY STATES
(Exclusive of ore containing 5 percent or more manganese and ore sold for paint)

State	1933		1934	
	Gross tons	Value	Gross tons	Value
Alabama	2,156,142	\$3,252,630	2,720,923	\$4,379,827
California	.....	.....	16,333	*
Georgia	302	*	1,098	*
Michigan	6,099,031	18,442,073	5,497,953	15,646,165
Minnesota	14,784,763	38,291,656	15,768,418	41,843,148
Missouri	.....	.....	4,154	13,271
New Jersey	73,385	*	145,326	*
New York	163,000	*	235,025	*
Pennsylvania	324,052	650,664	524,657	1,052,770
Tennessee	24,912	47,824	3,040	6,080
Utah	95,129	*	161,009	*
Virginia	287	574	297	594
Washington	1,631	*	1,920	*
Wisconsin	613,011	1,646,076	595,891	1,565,958
Wyoming	288,640	*	116,562	*
Undistributed	.....	†1,444,536	.....	†1,976,033
	24,624,285	63,776,033	25,792,606	66,483,846

* Included under "Undistributed."

† This figure includes value for states entered as "(*)" above.

The figures on production of iron ore in Alabama, Georgia, Missouri, New Jersey, New York, Washington, and Wisconsin were collected in cooperation with the state geological surveys and the figures for pig iron in Michigan were collected in cooperation with the Michigan Geological Survey.

More detailed information and statistics of the iron ore and pig iron industries will appear in the chapter on Iron Ore, Pig Iron, Ferro-Alloys, and Steel in *Minerals Yearbook 1935*, which will be issued in September.

PIG IRON

The production of pig iron in 1934, exclusive of ferro-alloys, was 15,686,442 gross tons compared with 13,027,343 gross tons in 1933. The production in

1934 was 20 percent more than in 1933, but 30 percent less than the average for the preceding five years. In the production of pig iron in 1934 there were used 25,173,825 gross tons of domestic iron ore and manganiferous iron ore, 1,314,623 tons of foreign iron ore and manganiferous iron ore, and 3,182,588 tons of cinder, scale, and scrap—a total of 29,671,036 tons. An average of 1.89 gross tons of metalliferous materials was consumed per ton of pig iron made in 1934 compared with 1.88 gross tons in 1933. The average consumption of ore per ton of pig iron made in 1934 was 1.69 tons compared with 1.67 tons in 1933.

The shipments of pig iron from blast furnaces in 1934, amounting to 15,632,619 gross tons valued at \$264,653,746, showed an increase of 9 percent in quantity and of 24 percent in total value over 1933.

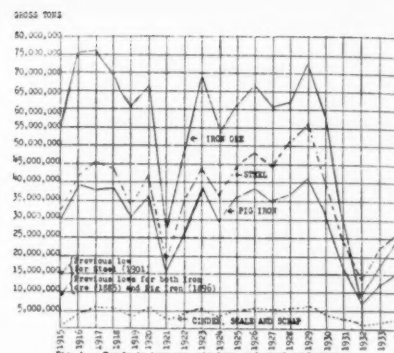


Fig. 1.—Trends in iron ore, pig iron, and steel production in the United States.
(The light dotted line represents the amount of cinder, scale and scrap used in the production of pig iron.)

The general average value of pig iron of all grades at the furnaces in 1934 was \$16.93 a ton compared with \$14.86 in 1933.

FERRO-ALLOYS

The shipments of ferro-alloys of all classes in 1934 amounted to 428,798 gross tons valued at \$34,634,957, an increase of 1.8 percent in quantity and of 21 percent in total value. The production of ferro-alloys in 1934 was 452,603 gross tons compared with 348,894 tons in 1933, an increase of 30 percent.

The production of ferromanganese in 1934 was 139,171 gross tons containing 109,491 tons of manganese (metal), an average of 78.67 percent manganese. Ferromanganese was made at six furnaces by five producers in 1934. In the production of ferromanganese in 1934 there were used 256,980 gross tons of foreign manganese ore, 853 tons of domestic manganese ore, 13,933 tons of iron ore, and 3,304 tons of cinder, scale, and scrap. The quantity of manganese ore used per ton of ferromanganese made in 1934 was 1.853 tons, in 1933 it was 1.793 tons, and in 1932 it was 1.798 tons. Of the foreign manganese ore used in 1934, Russia supplied 116,953 gross tons, Brazil, 55,778 tons; Africa, 18,076 tons; Cuba, 16,242 tons; India, 21,460 tons; Chile, 451 tons; and unspecified, 28,020 tons. The quantity of domestic man-

IRON ORE MINED IN THE UNITED STATES, 1933-34, IN GROSS TONS
(Exclusive of ore containing 5 percent or more manganese)

State	1933	1934
Alabama	2,133,457	2,343,819
California	25	16,333
Georgia	1,302	164
Michigan	2,433,949	5,039,144
Minnesota	11,948,596	15,389,870
Missouri	395	4,104
New Jersey	73,144	138,685
New York	58,718	244,962
Pennsylvania	264,366	525,297
Tennessee	24,912	3,345
Utah	95,279	161,109
Virginia	287	297
Washington	1,631	1,920
Wisconsin	228,487	602,005
Wyoming	288,640	116,562
	17,553,188	24,587,616

ganese ore used in the manufacture of ferromanganese in 1934 represented only 0.33 percent of the total manganese ore used, compared with 4.4 percent in 1933.

The production of ferrosilicon in 1934 was 208,531 gross tons, of which 141,279 tons were made by the blast-furnace process, 67,010 tons by the electric-furnace process, and 242 tons as a by-product of the manufacture of artificial abrasives in electric furnaces.

The production of ferrovanadium in 1934 was 944 gross tons averaging about 40 percent vanadium. The shipments of ferrovanadium in 1934 amounted to 864 tons and contained 771,600 pounds of vanadium.

The production of ferrotungsten in 1934 was 1,142 gross tons averaging 80 percent tungsten. The shipments of ferrotungsten in 1934 amounted to 1,188 tons and contained 2,128,260 pounds of tungsten.

IN THE recent balloting of employees of the United States Steel Corp. subsidiaries, a total of 87.1 percent of those eligible to vote actually cast their ballots and elected representatives of their own choosing. The total vote cast was 116,179 out of 133,370 eligible, and the number of employees at work on the day of the election was 107,743. The Oliver Iron Mining Co. voted 87 percent, and the American Steel & Wire Co. 94.4 percent.

More than 8,000 workers whose names are on the payrolls of the Steel Corporation, but who were not on duty at the time of the balloting, made special trips to the plants to cast their votes in favor of having a fellow employee represent them.

This enthusiastic endorsement of the employees' representation plan is of special interest at this time, in view of the iniquitous Wagner Labor Disputes law. This law was designed to destroy the open shop, and its enactment was one of the most subtle blows at freedom in the history of the nation. The union labor lobby at Washington, eager for furthering the power of the American Federation of Labor, possibly does not recognize that. The Wagner bill is aimed at the larger employers of labor, and if it proves to be constitutional, which is very doubtful, the Federation will proceed at its leisure to try and force the union upon all employers of any considerable number of employees. The words "try and force" is used advisedly. It is not reasonable to expect that this law can ever be successfully enforced. The time has not yet arrived in this country when even Congress can tell any citizen, even by inference, that he must join the union or he cannot work, or tell an employer that he must discharge this or that man because the union doesn't approve of him.

—As reported by *Skills Review*.

Lead and Zinc

UNITED STATES SMELTING, REFINING & MINING CO. is adding a \$200,000 unit to its flotation plant at Midvale, Utah, which will increase the

PIG IRON SHIPPED FROM BLAST FURNACES IN THE UNITED STATES, 1933-34, BY STATES

State	1933		1934	
	Gross tons	Value	Gross tons	Value
Alabama	987,606	\$11,385,080	1,144,900	\$15,805,365
Colorado	*	*	*	*
Illinois	1,269,940	20,063,481	1,430,841	25,768,115
Indiana	1,296,518	19,989,998	1,545,011	27,977,992
Iowa	*	*	*	*
Kentucky	103,017	*	170,399	*
Maryland	639,539	*	704,304	*
Massachusetts	*	*	*	*
Michigan	407,011	6,181,318	644,895	9,987,451
Minnesota	*	*	*	*
New York	851,496	12,344,827	961,679	14,621,274
Ohio	4,188,482	60,995,721	4,147,116	68,525,145
Pennsylvania	3,952,862	62,797,008	4,173,412	76,740,066
Tennessee	14,656	*	10,760	*
Utah	*	*	*	*
Virginia	3,092	*	3,843	*
West Virginia	449,219	*	445,688	*
Undistributed	†189,759	†19,590,150	†249,771	†25,228,338
	14,353,197	213,347,583	15,632,619	264,653,746

* Included under "Undistributed."

† Includes figures for states entered as "(*)" above.

FERRO-ALLOYS SHIPPED FROM FURNACES IN THE UNITED STATES, 1933-34, BY VARIETIES

Variety of alloy	1933		1934	
	Gross tons	Value	Gross tons	Value
Ferromanganese	127,453	\$9,384,611	147,947	\$12,345,697
Spiegeleisen	50,218	1,144,642	45,769	1,099,922
Ferrosilicon (7 percent or more Si)	199,524	7,349,681	181,209	7,401,799
Ferrotungsten	952	1,550,854	1,188	2,459,432
Ferrovanadium	890	1,961,644	864	*
Other varieties†	42,386	7,262,362	51,821	*11,328,107
	421,423	28,653,794	428,798	34,634,957

* Value of ferrovanadium included with "Other varieties" in 1934.

† Ferrochromium, ferromolybdenum and calcium-molybdenum compounds, ferro-phosphorus, ferrotitanium, ferrozirconium, silicomanganese and silico-spiegeleisen, and zirconium-ferrosilicon.

capacity from 1,000 to 1,800 tons per day. This is due to the increase in receipts in its custom department due to higher prices for gold and silver. The smelter has seven blast furnaces and has a capacity of smelting 481,800 tons of charge per year. The lead-zinc flotation mill has a daily capacity at present of about 1,000 tons. The company's refinery located at Midvale has an annual capacity of 72,000 tons.

AFTER negotiations lasting for several months it now appears that a settlement has been reached with regard to the changes deemed necessary in the lead and zinc import duties in England. Instead of ad valorem taxation at 10 percent which was introduced in March, 1932, there is to be, it is understood, a fixed charge of 7s 6d per ton on foreign lead and 12s 6d on foreign zinc, while brands of British origin, whether from overseas or produced in this country may be sold at permitted premiums of an equal amount. This means that if the Empire interests elect to hold for the full amount of the premium foreign and British metal will be available for the consumer at the same price, the basis of which will be the London Metal Exchange quotation. With foreign and

Empire metal on an approximately equal footing it ought to be possible to bring about more activity on the Metal Exchange where for most of the period covered by taxation of lead and zinc, business has been very one sided, because users were afraid that they would be given foreign dutiable metal against purchases made on the exchange and therefore elected to buy on the open market.—(As reported by American Metal Market.)

NEW MINING MANUAL PUBLISHED

THE Mining Manual for 1935, a publication giving the particulars on the mining companies, has just been published by The Statistical Research Bureau, 108 West 6th Street, Los Angeles. The Manual covers over 500 mines and mining companies in its 320 pages, each report giving the latest information on capitalization, officers and directors, registrar and transfer agents, office address, property, development and equipment, dividend and assessment records, current financial position and earnings.

In addition to the corporate information, the Manual contains a detailed map

(Dry Tons of 2,000 lbs.)						
	Zinc Concentrates			Lead Concentrates		
	This Week	Last Week	Year Ago	This Week	Last Week	Year Ago
Total stocks (sold and unsold).....	19,914	19,227	19,231	18,070	17,993	13,117
Net reserve stock.....	17,643	17,042	18,757	18,117	17,971	13,113
Production *.....	7,216	6,397	582	905	567	134
Shipments.....	6,529	5,990	2,674	828	321	247
Sales reported.....	6,615	6,525	2,802	759	271	242
* Included Tailing Mill production.....	2,028	1,799	25			
Base price—Joplin.....	\$28.00	\$28.00	\$28.00	\$40.00	\$40.00	\$37.50
Metal price—Average for week:						
Zinc, E. St. L.—Lead, St. L....	4.300c	4.300c	4.300c	4.000c	3.990c	3.620c
Mill Statistics						
				This Week	Last Week	Year Ago
Mills producing more than 25 tons:						
Mine mills operated 32 hours or more.....				23	23	3
Mine mills operated less than 32 hours.....				0	0	0
Tailing mills operated 96 hours or more.....				19	19	0
Tailing mills operated less than 96 hours.....				1	0	0
Total.....				43	42	3
Mills producing less than 25 tons:						
Mine mills.....				5	4	
Tailing mills.....				1	0	
Total.....				6	4	7
Total number mills operated.....				49	46	10

Mine Mills Operated This Week: Admiralty No. 2, American Diamond, Black Eagle, Byrd, Mary Jane, Cardin No. 2, C. M. & R. Bird Dog and See Sah, V. H. Barr, D. & C., E. P. Central, E. W. No. 4, Bluebonnet, Interstate Woodchuck, K. & O. Discard, Lavrion, Lost Trail, Peru, Mary M. Beck, Mission, New Blue Mound, Playter, Rialto, St. Louis No. 4 and No. 8, St. Nicholas, U. Z. Royal, Velie Lion and Dines.

Tailing Mills Operated This Week: Atlas, Aul, Bailey, Beck No. 3, Britt, Cardin No. 1, C. M. & R. Beaver, Chubb, Webber, King Brand, E. W. No. 7, Peru Laclede, Lawyers, Prairie Chicken, Semple Early Bird and Rightley, Skelton, Mo. Chitwood, Tri-State Ottawa, Wills, Youngman.—(Tri-State Zinc & Lead Ore Producers Ass'n.)

of the mining districts of the Western states, a glossary of mining terms, mineral production statistics compiled since the beginning of records in the United States, a directory of manufacturers and distributors of mining machinery and supplies, summaries of 1934 transactions in mining securities of the leading exchanges, and a directory of stockbrokers active in mining securities.

POTASH produced in the United States in 1934 amounted to 275,732 short tons of potassium salts equivalent to 144,342 short tons of potash (K₂O), a decrease of 17 percent in gross weight but an increase of 0.7 percent in K₂O content compared with 1933 (333,110 tons gross weight, and 143,378 tons K₂O).

The sales of 224,875 tons of potash salts with a potash content of 114,122 tons in 1934, were 18 percent and 21 percent, respectively, less than the production, and decreased 31 percent for potash salts, and 18 percent for K₂O content, compared with 1933 (325,481 tons salts, 139,067 tons K₂O). The value, at the plant, of the potash salts sold was \$2,813,218, a decrease of 47 percent from 1933 (\$5,296,793). The average value per ton was \$12.51 in 1934, compared with \$16.27 in 1933. The value per unit (20 pounds) of K₂O was 25 cents in 1934, compared with 38 cents in 1933. About 96,000 tons of potassium salts with an available content of 50,000 tons of K₂O remained in producers' stocks on

December 31, 1934. The average K₂O content of the salts sold in 1934 was 50.7 percent compared with 42.7 percent in 1933.

The chief sources of potash production in 1933 were from natural brines at Trona, Calif., where the potash is produced as a co-product with borax and other sodium compounds and from potash minerals mined at Carlsbad, Eddy County, N. Mex. Potash was also recovered from distillery waste and from cement kiln dust. Small quantities of cotton boll ashes and of alunite or other potash-bearing rocks were shipped for fertilizer filler or for direct application as a fertilizing agent. The principal producers were American Potash & Chemical Corporation, 70 Pine Street, New York, N. Y., and Trona, Calif.; United States Potash Company, Inc., 342 Madison Avenue, New York, N. Y., and Carlsbad, N. Mex.; The Potash Company of America, Mercantile Trust Building, Baltimore, Md., and Carlsbad, N. Mex.; United States Industrial Chemical Company, Inc., 60 East 40th Street, New York, N. Y., and Baltimore, Md.; and North American Cement Corporation, 1004 Baltimore Trust Building, Baltimore and Security, Md.

Complete final detailed information and statistics on potash in 1934 and a brief history of the domestic potash industry will appear in the "Minerals Year Book 1935," to be issued in August, 1935.

The potash salts imported into the United States in 1934, according to the Bureau of Foreign and Domestic Commerce, amounted to 486,167 short tons, with an estimated equivalent of 178,533 short tons of potash. This represented an increase of 1 percent in gross weight over the imports for 1933 (479,429 tons). Eighty-eight percent of the gross imports were used chiefly in fertilizers, and this product—428,156 short tons (K₂O equivalent, approximately 154,735 short tons), valued at \$7,769,286—increased 0.6 percent in gross weight and decreased 7 percent in value over 1933—425,571 tons gross weight (approximate equivalent in K₂O, 149,090 tons), valued at \$8,351,428.

The potassium salts imported chiefly for the chemical industry amounted to 58,011 short tons (K₂O equivalent, approximately 23,798 short tons), valued at \$3,847,632, an increase of 8 percent in gross weight and of 4.5 percent in value over 1933—53,858 short tons (approximate equivalent K₂O, 22,764 tons), valued at \$3,465,030.

The exports of potassium salts amounted to 2,121 short tons of potassium compounds (not fertilizer), valued at \$466,929; 27,988 short tons of potash fertilizers, valued at \$918,169. These figures represent an increase over 1933 of 66 percent in quantity and 55 percent in value of potassium compounds (not fertilizer) and an increase of less than 1 percent in quantity and of 2 percent in value of potash fertilizer. Eighty-one percent (22,784 tons, \$752,327) of the salts exported were shipped to Japan, 17 percent (4,753 tons, \$150,535) to Canada, and the remainder in small quantities to South America, Central America, the Philippine Islands, and the West Indies.

|| The Hitch Drill

(Continued from page 20)

main bottoms with large "I" beams, hitch holes of corresponding size could be drilled to receive the ends of the beams.

The possibilities of this machine are not limited to timbering, since it has drilled a 24-in. hole through a chain pillar 20 ft. thick.

I am of the opinion that holes drilled at short intervals, especially in the chain pillar in main headings, would give you a firmer chain pillar and eventually make for greatly improved ventilation with resultant economy.

At present we have two machines, one at our No. 8 mine and one at No. 10 mine. We have timbered approximately eight miles of entry with these machines at approximately one-third the cost of timbering under the old method. Not only has it proven more economical and safer to timber in this manner, but we have been able, after a shut-down of six-months' duration, upon entering the mine, to run a haulage motor to a parting two miles from the bottom within thirty minutes. This is something that could not have been accomplished under the old method of timbering.

NEWS OF MANUFACTURERS

A BOOKLET describing pellet "D," a new pellet powder, has just been issued by Hercules Powder Company, Wilmington, Del.

Pellet "D," according to Hercules engineers, is an entirely new type of pellet powder that offers coal miners the important advantage of reduced smoke and fumes, besides unusual economy and lump-producing action. Making a powder with these characteristics was accomplished by changing the composition of the black powder used in Hercules Pellet "D." Hercules claims a wide range of use for the new pellet powder, which has been used successfully in hard and soft veins of coal in practically every coal-mining district in the country.

It has 125 cartridges (1 1/4 in. by 8 in.) in a 50-lb. box.

The booklet will be mailed free to those interested.

INFORMATION of interest to fabricators and users of stainless steel is contained in a pamphlet entitled "Stainless Steels Treated with Columbium," just issued by Electro Metallurgical Company, 30 East 42nd Street, New York. The pamphlet shows how the addition of columbium to the austenitic type of stainless steel results in the elimination of intergranular corrosion. Comprehensive data are given on the physical properties and corrosion-resistance of columbium-treated steels.

Of particular interest is the fact that these steels, when welded with columbium-treated welding rods, exhibit no susceptibility to grain-boundary deterioration in the "as welded" condition, so that full corrosion resistance is obtained without heat-treatment after welding.

JOHAN THIES, formerly in charge of sales in the Birmingham district for the Portable Lamp and Equipment Company, of Pittsburgh, has been moved to Terre Haute, Ind., and given an enlarged territory covering Indiana, Illinois, and Kentucky. Andrew Forbes succeeds Mr. Thies in the Birmingham field.

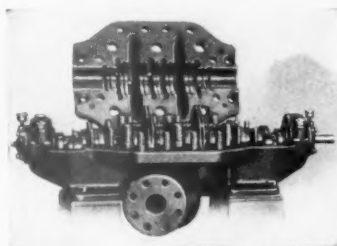
A NEW Ingersoll-Rand bulletin describes two new pieces of equipment for the permanent blacksmith shop, the 54 drill sharpener and the 27F oil furnace. Both of these tools have many

improvements. The new bulletin describes the features that have been developed. In addition the new bulletin illustrates and lists the complete I-R line of sharpeners and low-pressure furnaces. A copy can be obtained from Ingersoll-Rand Company, 11 Broadway, New York, N. Y., or any branch office. Ask for form No. 2176.

THE BROWN INSTRUMENT COMPANY has just issued an illustrated catalog which briefly describes the advantages of using Brown instruments for reducing costs in boiler room and plant process. Copy of this folder will be sent upon request to their home office at Philadelphia, Pa.

THE new type "MM" multi-stage pump, developed by Allis-Chalmers Manufacturing Company, Milwaukee, Wis., for heads from 500 to 1,600 ft., and capacities up to 400 gallons per minute, is designed along the general lines of the well-known Allis-Chalmers type "M" pump.

"MM" pumps are horizontal shaft, split casing, double suction, bronze fitted . . . the use of double suction runners equalizes end thrust and eliminates the use of internal balancing arrangements. Each stage of the casing has a spiral volute and between stages the liquid flows from one volute into an exceptionally long diffusion nozzle and then into a long sweep return bend to the inlet passages of the following stage. This construction results in maximum practical regain of pressure between stages as the liquid is directed along smooth flow lines without sudden changes in velocity.

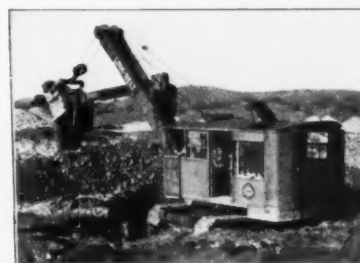


The pressure on the stuffing boxes is kept to approximately the suction pressure.

They are particularly economical for boiler feed, mine drainage, sluicing and other head pumping services.

are discontinued, the new machines embody other features which assure their attaining the maximum in ease of operation and maintenance, in performance and in service life.

The Link-Belt line of crawler, shovels, cranes, draglines, now comprises models K-25, K-30, K-40, K-45, K-48, and K-55, ranging from 3/4 to 3 cu. yd. capacity. All are built for heavy-duty service and arranged for gasoline engine, Diesel engine, or electric motor drive. The new models, like the old, can be used as a shovel, a crane, a dragline, a trench hoe, etc., and may be furnished with any or all of the several attachments that are usually available only on smaller machines or machines of limited characteristics. It is pointed out that this ease of convertibility reduces the owner's investment in equipment to a minimum without limiting the range of work possible.



As a shovel, K-40 and K-45 machines are standardly equipped with a 22-ft. shovel boom; a 16-ft. 6-in. dipper stick; and an all-manganese steel, heavy-duty dipper, which is of 1 1/4 cu. yd. struck-measure capacity on the K-40, and 1 1/2 cu. yd. struck-measure capacity on the K-45, or with correspondingly larger dipper for lighter service.

As a dragline, the K-40 will handle a 1 1/4 to 1 1/2-cu.-yd capacity heavy-duty bucket on a 45 to 50-ft. boom, and K-45 a 1 1/2 to 1 3/4 cu. yd. capacity heavy-duty dragline bucket. Correspondingly larger buckets for lighter service may be used. In either case, the boom may be used at any angle convenient for dragline work.

As a crane, the K-40 has a rated capacity of 21 tons at 12-ft. radius and 6,600 lbs. at 45-ft. radius, on a 45-ft. boom. The K-45 has a rated capacity of 25 tons at 12-ft. radius and 7,600 lbs. at 45-ft. radius, on a 45-ft. boom. Each machine has corresponding capacities at other radii and for other boom lengths.

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ANNOUNCEMENT is made by Link-Belt Company, Chicago, of the perfection and the placing on the market of two new models of crawler-mounted shovels, cranes, draglines, to be known as models K-40 and K-45, respectively. It is stated that while the basic design is similar to that of the two models that

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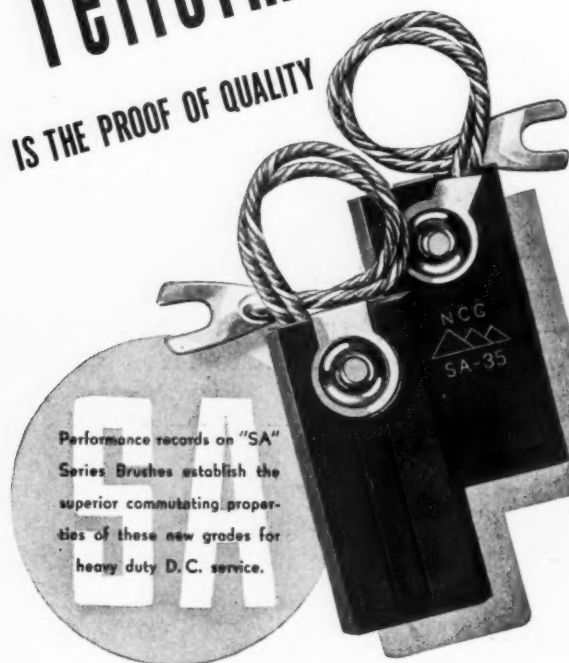
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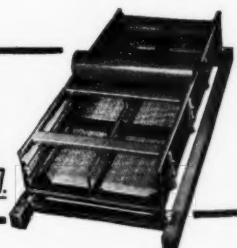
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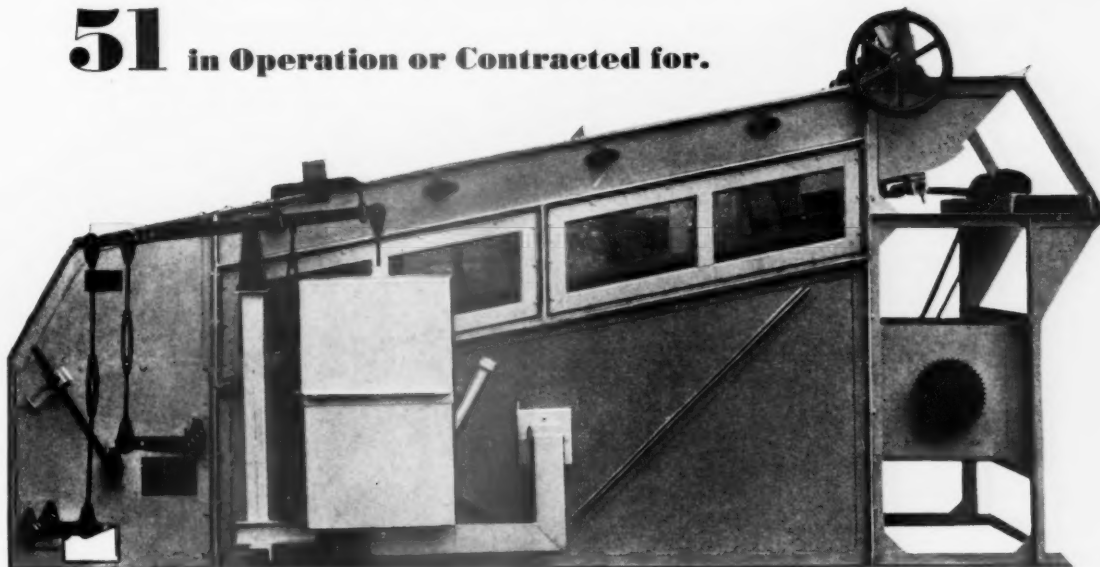
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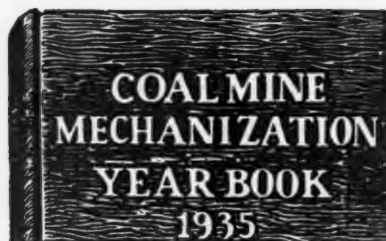
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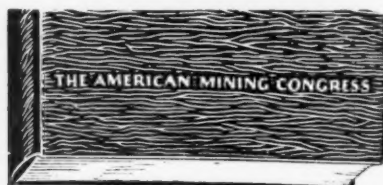
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